

Flood Risk Assessment for Planning

May 2026

Prepared for:

Mr David Rahman

Location:

78 Broadwood Avenue

Ruislip

HA4 7XR

Our reference:

97390-ScandiaHus-BroadwoodAve



Document Issue Record

Project Details	
Project:	Flood Risk Assessment for Planning
Prepared for:	Mr David Rahman
Application:	Replacement dwelling
Location:	78 Broadwood Avenue, Ruislip, HA4 7XR
Our reference:	97390-ScandiaHus-BroadwoodAve
Issue no.:	v1.0
Issue date:	15 th May 2026

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1. Key Facts

Flood Risk Posed:

- The site is located partially within Flood Zone 1 (Low Probability), defined as land having a less than 1 in 1,000 annual probability of river and sea flooding, partially within Flood Zone 2 (Medium Probability), defined as land having between a 1 in 1000 and 1 in 100 annual probability of river and sea flooding, and partially within Flood Zone 3 (High Probability), defined as having at least a 1 in 100 annual probability of river and sea flooding.
- The site is shown to be partially within the EA Flood Zones plus climate change (2070 to 2125) extent.
- The nearest watercourse to the site is approximately 95m to west, which is an ordinary watercourse which is a tributary of the River Pinn. The River Pinn is approximately 285m to the south of the site.
- The EA has provided modelled flood data from the Pinn – Ruislip Park Wood and Pinn Meadows FAS flood model (also referred to as the Ruislip (Pinn) 2021 model).
- The whole site is shown to be outside of the modelled 1:20 year, 1:50 year and 1:100 year flood extents, with part of the site shown to be within the modelled 1:1000 year extent.
- Comparison of the modelled 1:100 year +25% climate change flood level (42.82mAOD) with topographic site levels (42.88mAOD to 43.30mAOD) shows that the site is entirely above the modelled 1:100 year plus climate change flood level.
- As such, the whole site is shown to be above the design flood level for planning (1:100 year plus 25% climate change).
- The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “High” chance of flooding from surface water at the present day.
- The EA Risk of Flooding from Surface Water mapping shows the site to be at “Very Low” to “High” chance of flooding between 2040 and 2060.
- According to the West London SFRA surface water flood maps the site is at a very low to high risk of flooding.
- The West London SFRA shows the site lies within an area that has $\geq 25\%$ $< 50\%$ susceptibility to groundwater flooding (EA 2017), and is outside areas identified as at increase potential for elevated groundwater (GLA 2011).
- The West London SFRA shows the site to fall within a postcode area where there has been no reported incidents of sewer flooding from Thames Water (2017).
- The site is located outside the maximum inundation extent on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely.
- The EA hold no records of historic flooding having affected the site.

Flood Risk Mitigation:

- The proposed application is for a Replacement dwelling.
- There will be no additional or separate units or dwellings introduced as part of the development.
- Internal access will be maintained from the ground floor to the upper floors of the building.
- Post development, the site will remain “more vulnerable” (residential).
- Flood proofing of the development will be incorporated as appropriate.
- There will be no unacceptable loss of fluvial or surface water floodplain storage.
- An area of the rear garden amounting to approximately 90m² would need to be lowered by 0.15m (15cm), to provide the flood storage required for compensation with connectivity to the modelled 1:100 year surface water flood extent (Medium).
- The applicant will register with the EA’s flood warning service (the site lies within the River Pinn at Ruislip Flood Warning Area), and the National Severe Weather Warning Service.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

2. Introduction

- 2.1. Unda Consulting Limited have been appointed by Mr David Rahman (hereinafter referred to as “the applicant”) to undertake a Flood Risk Assessment for the proposed development at 78 Broadwood Avenue, Ruislip, HA4 7XR (hereinafter referred to as “the site”). The purpose of the study is to support a planning application for the proposed development.
- 2.2. This report presents our findings based on the readily available information and data relating to the site and surrounding drainage area.
- 2.3. The site appears to be located within Flood Zones 1, 2 and 3 as defined by the Environment Agency (EA) on their Flood Map for Planning. Under the National Planning Policy Framework (NPPF), a FRA is required for all development or changes of use proposed:
- In Flood Zones 2 or 3 or see flood map for planning;
 - Within Flood Zone 3b;
 - Within Flood Zone 1 with a site area of 1 hectare or more;
 - Within ‘Flood Zones plus Climate Change’, showing it is at increased risk of flooding from rivers or sea in future - see flood map for planning;
 - With Flood Zone 1 and the flood map for planning shows it is at risk of flooding from surface water;
 - In areas with critical drainage problems;
 - Within Flood Zone 1 where the LPA's strategic flood risk assessment (SFRA) shows it will be at increased risk of flooding during its lifetime;
 - That increases the vulnerability classification and may be subject to sources of flooding other than rivers or sea.
- 2.4. It is understood that the site also falls within an area at potential risk of surface water flooding.
- 2.5. The assessment should demonstrate to the Local Planning Authority (LPA) and EA how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.
- Whether the proposed development is likely to be affected by current or future flooding from any source;
 - Whether it will increase flood risk elsewhere;
 - Whether the measures proposed to deal with these effects and risks are appropriate.

3. Existing Site

- 3.1. The site is comprised of a two-storey residential dwelling.
- 3.2. The site is understood to have lawful planning permission for residential use.
- 3.3. The surrounding area is characterised by residential properties.
- 3.4. Existing plans are provided in the report Appendix.

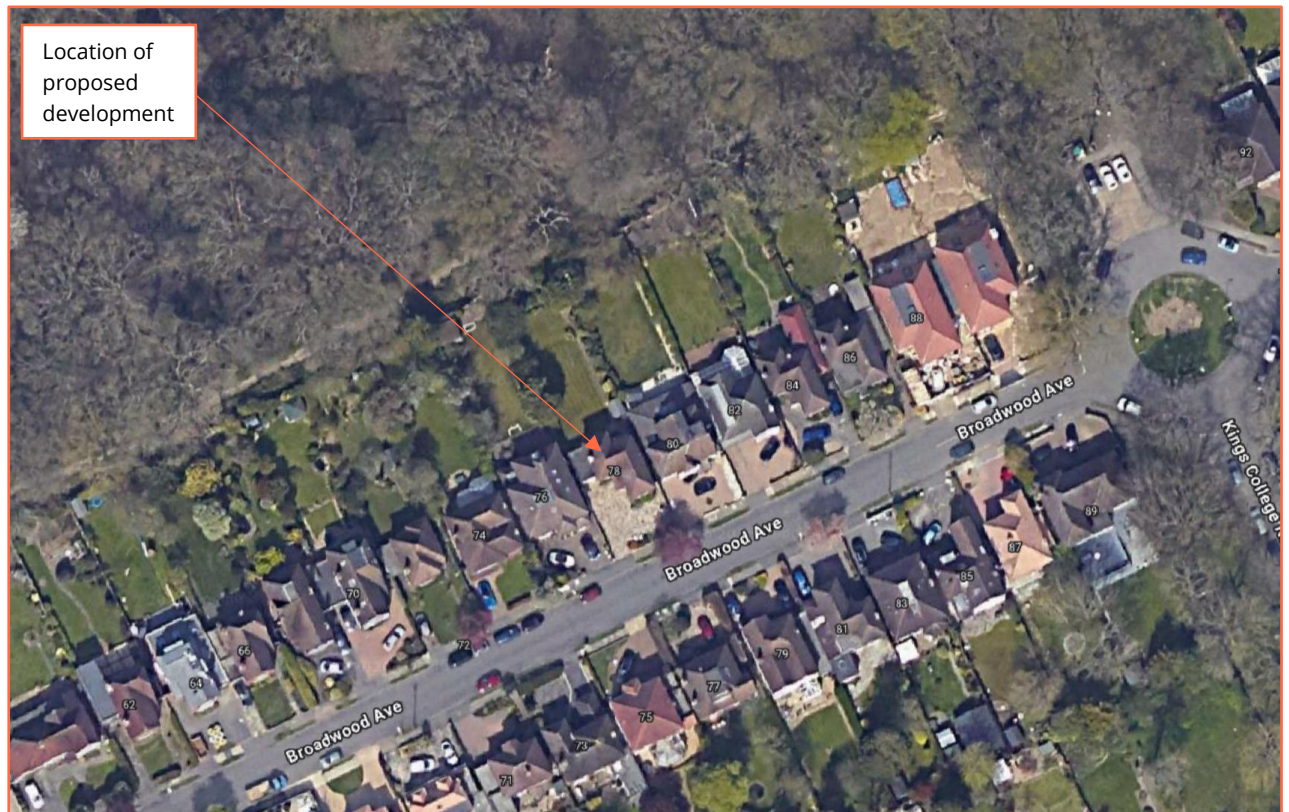


Figure 1: Aerial imagery of site and surrounding area (Source: Google Earth)

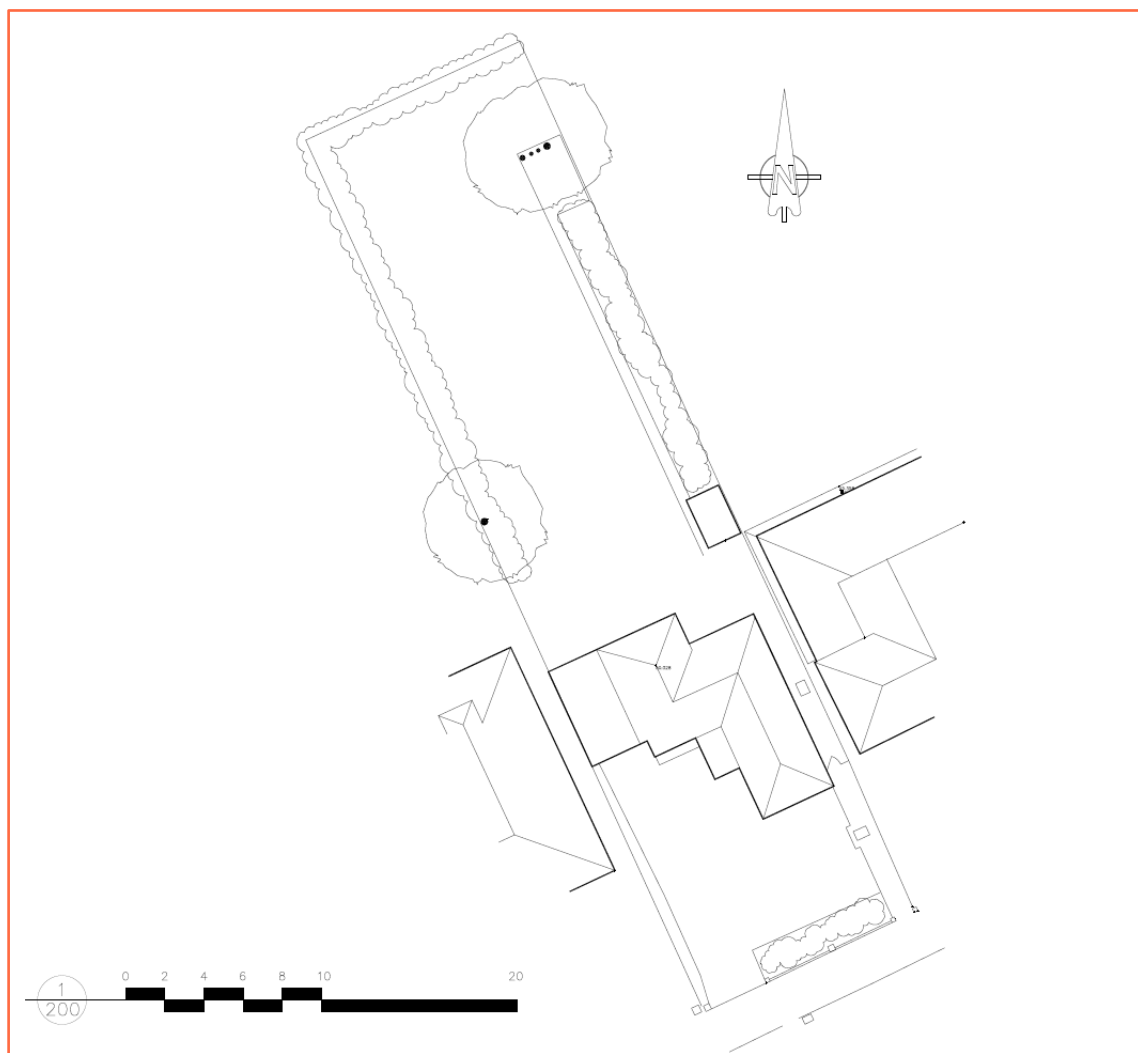


Figure 2: Existing site plan (Source: Applicant)

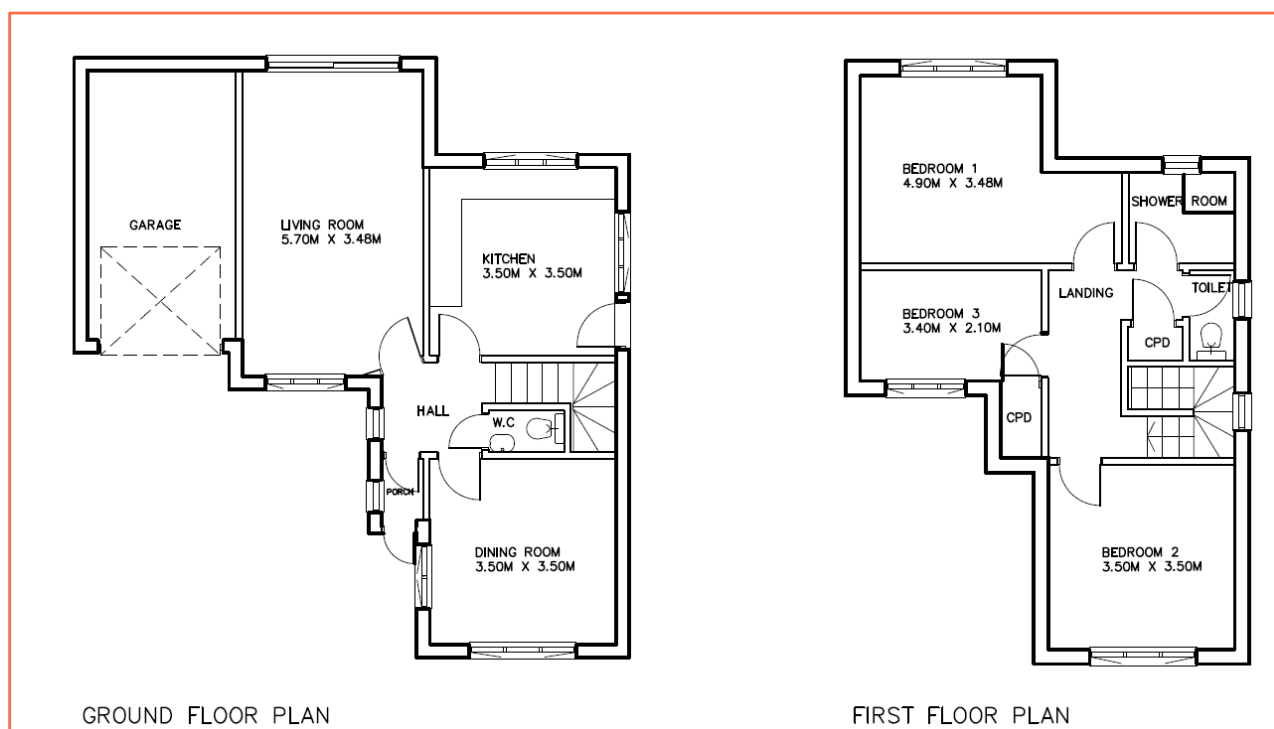


Figure 3: Existing floor plans (Source: Applicant)

Site Topography:

- 3.5. Environment Agency LiDAR has been used to assess the topography across the site and wider area. Light Detection and Ranging (LiDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground surface. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at high spatial resolutions. The EA's LiDAR data archive contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to +/-5cm to 15cm with spatial resolutions ranging from 25cm to 2 metres. This dataset is derived from a combination of the full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LiDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model. 1.0m horizontal resolution DTM LiDAR data has been used for the purposes of this study.
- 3.6. LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 42.88mAOD to 43.30mAOD. The slopes generally down from north to south.

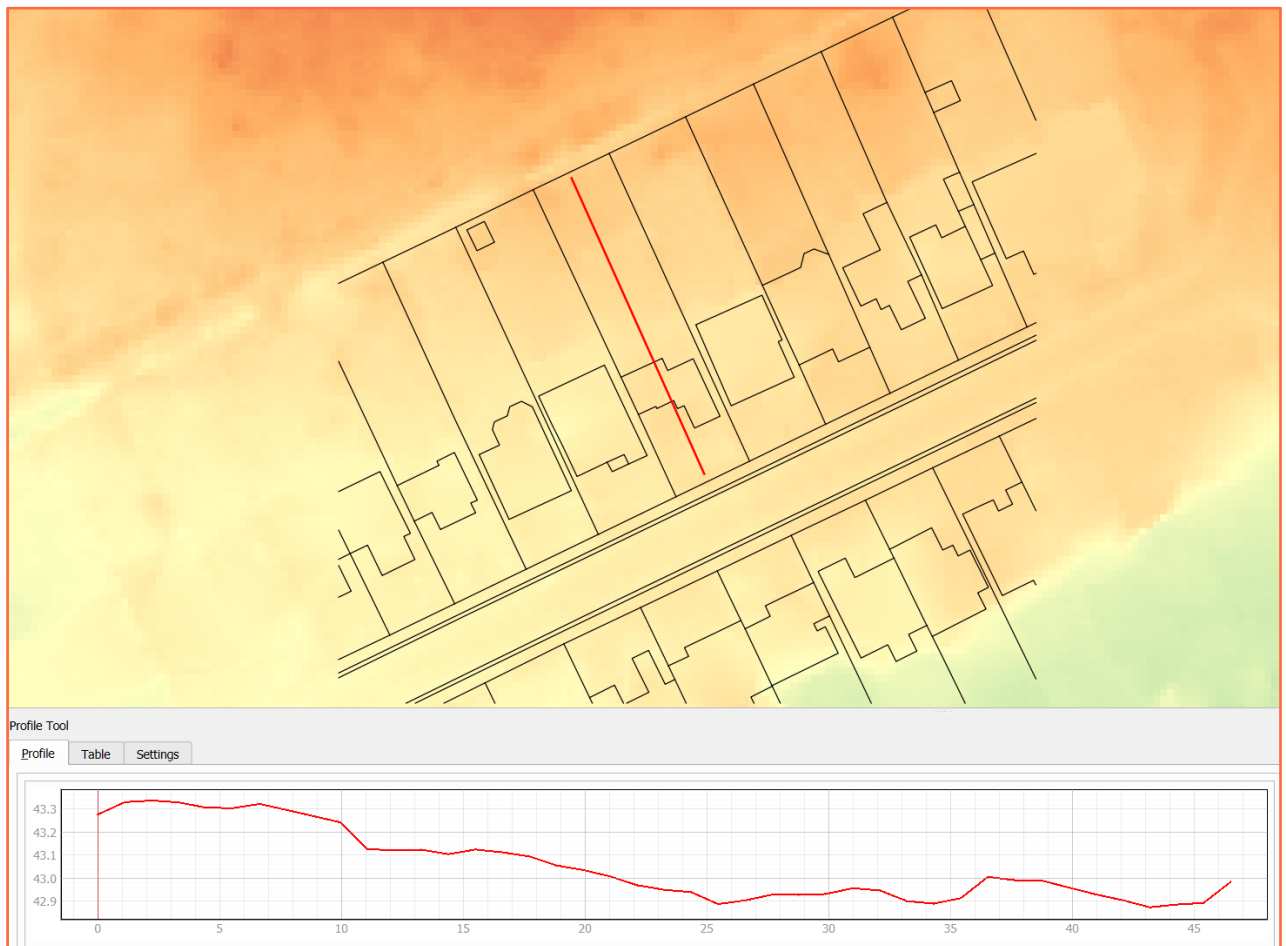


Figure 4: EA 1m LiDAR DTM showing topographic levels across the site. Transect shown by red line runs from north to south (Source: EA, OS)

Existing Ground Conditions:

- 3.7. The 1:50,000 BGS map shows that the bedrock underlying the site is Lambeth Group – Clay, Silt and Sand.
- 3.8. The BGS mapping shows no superficial deposits underlying the site.

- 3.9. The soil type taken from the UKSO Soil Map Viewer, shows the site to located upon relatively deep soils of Prequaternary Marine/Estuarine Sand and Silt parent material with a soil texture of Clayey Loam to Silty Loam.

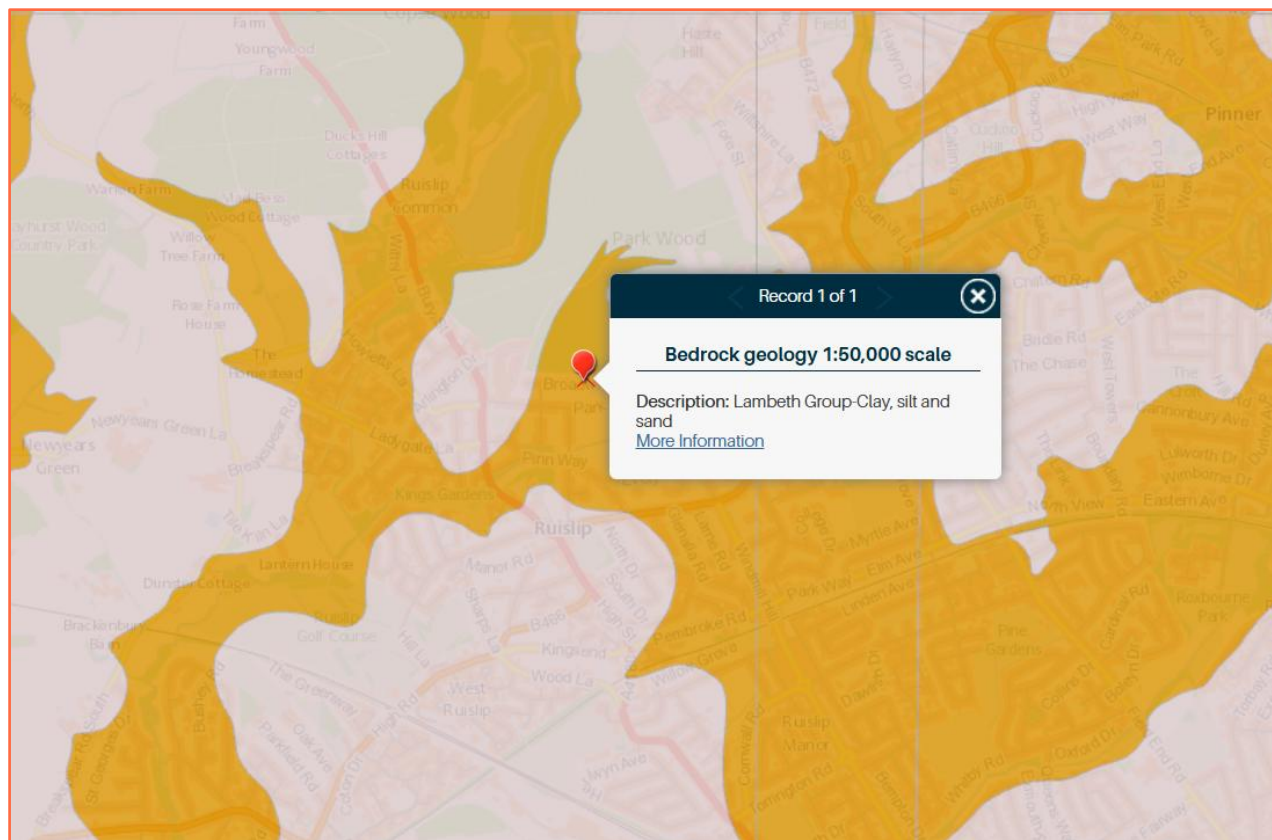


Figure 5: BGS Bedrock Geology (Source: BGS)

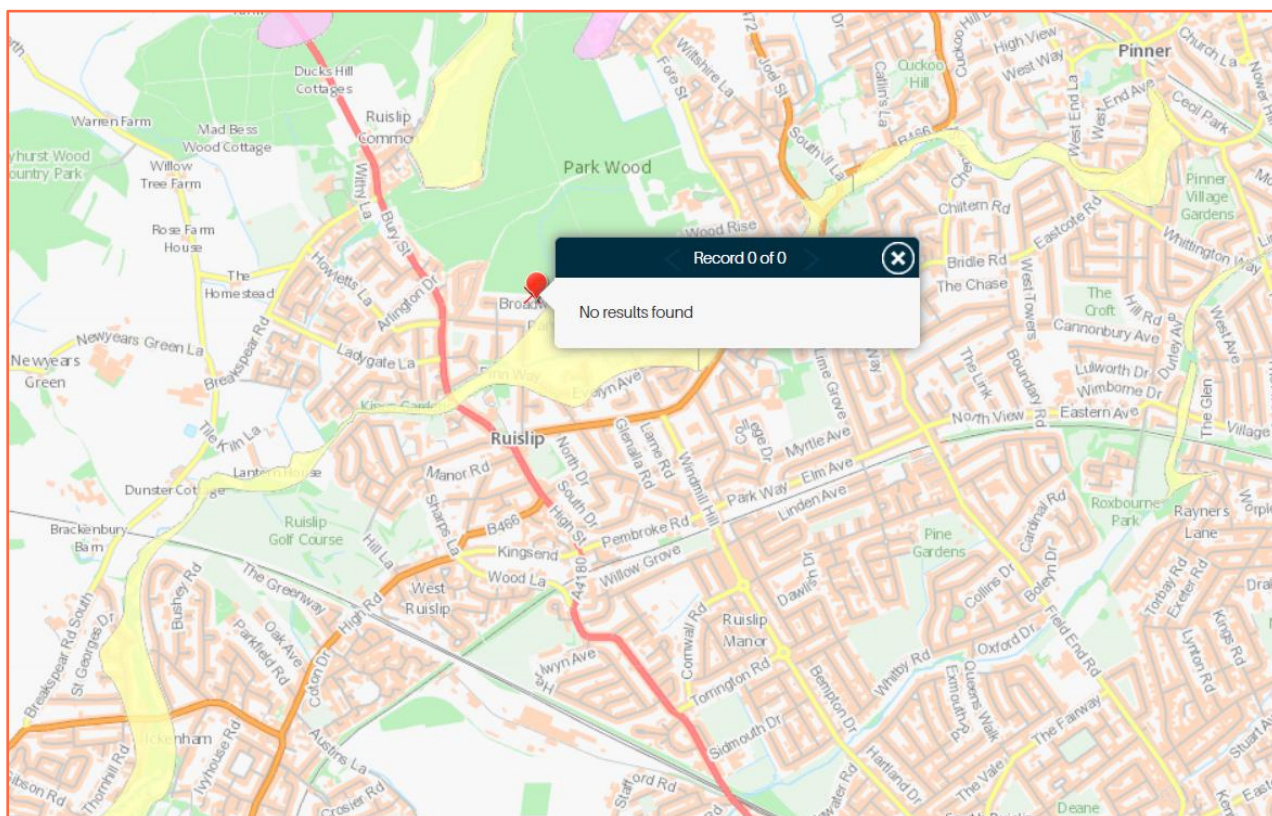


Figure 6: BGS superficial deposits (Source: BGS)

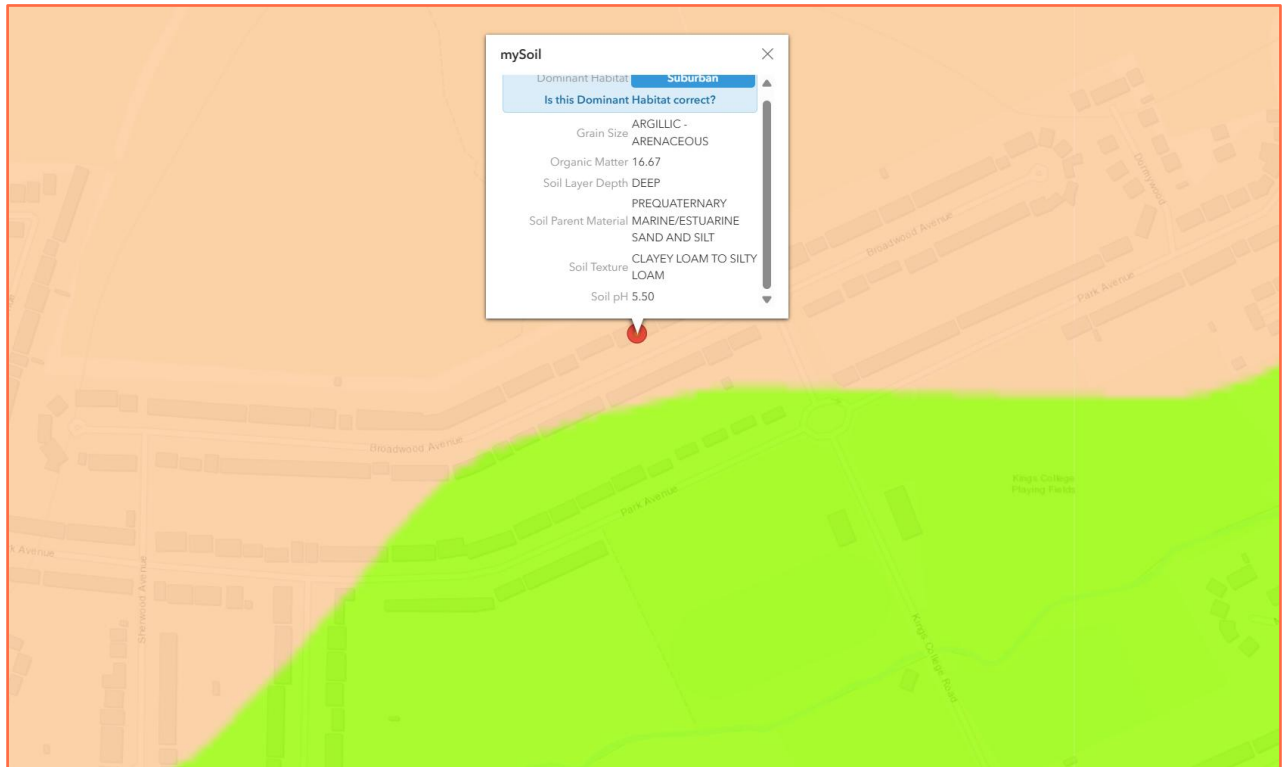


Figure 7: Soil map (Source: UK Soils, BGS)

Nearby Watercourses / Drainage Features:

- 3.10. The nearest watercourse to the site is approximately 95m to west, which is an ordinary watercourse which is a tributary of the River Pin. The River Pinn is approximately 285m to the south of the site.

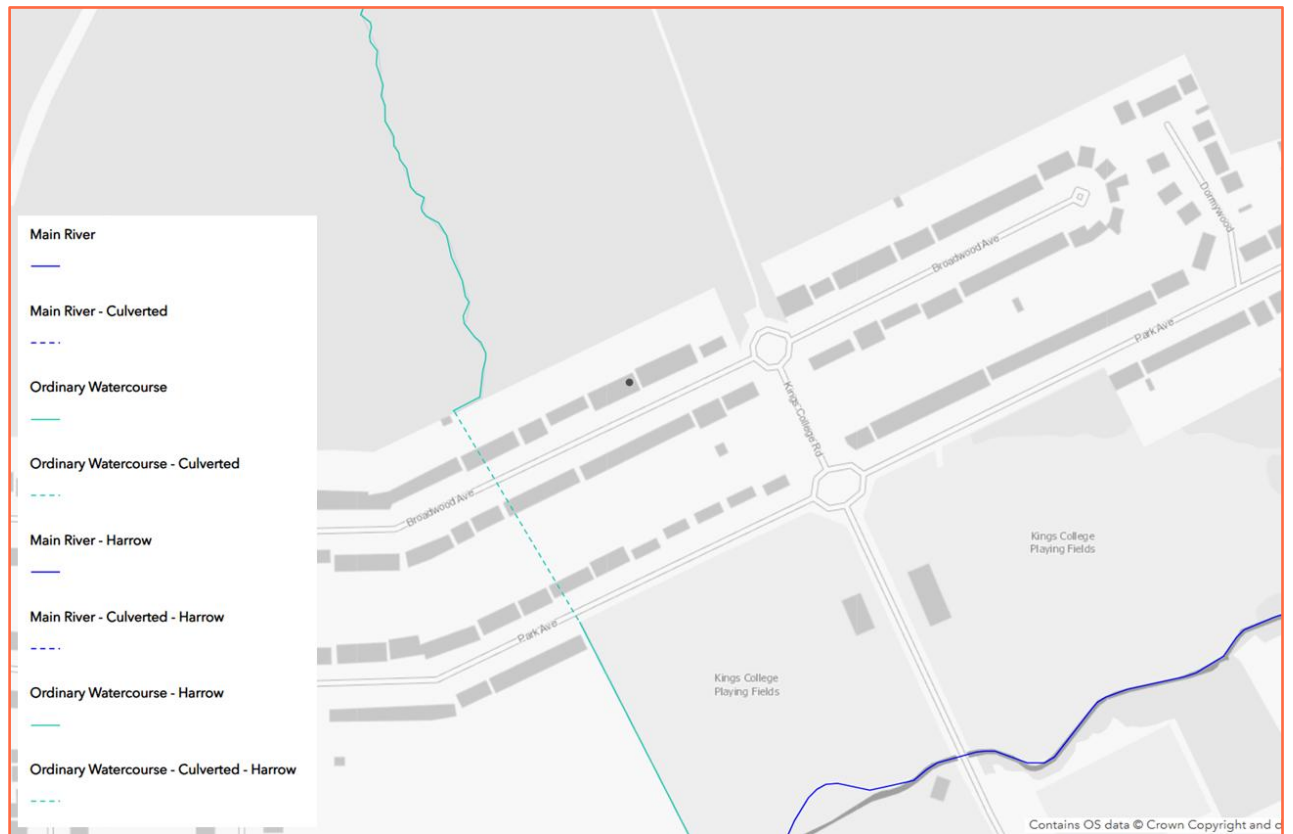


Figure 8: West London SFRA Flood Management Infrastructure (Source: West London SFRA)

4. Development Proposal

- 4.1. The proposed application is for the Replacement dwelling.
- 4.2. Proposed plans are provided in the report Appendix.

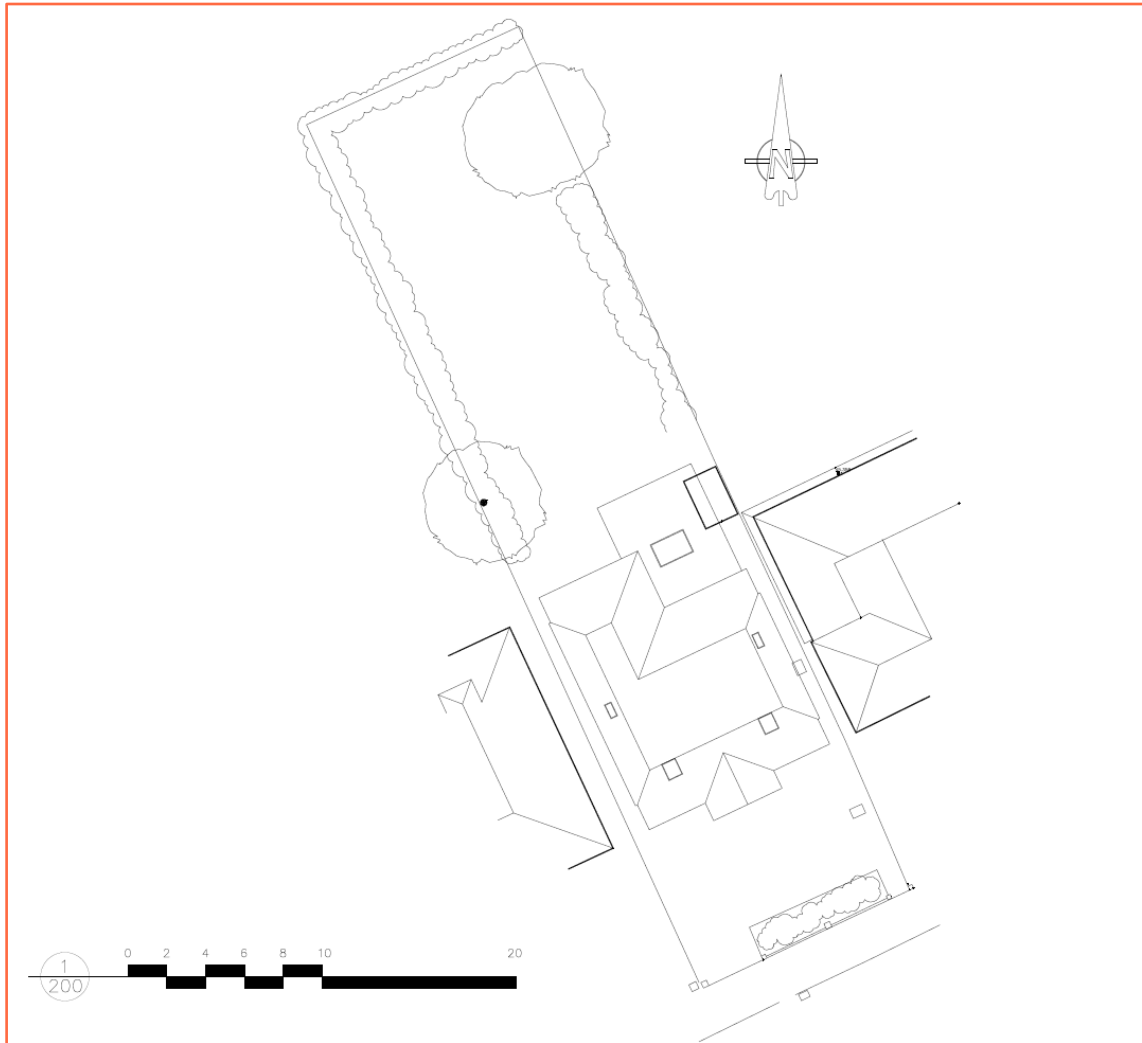


Figure 9: Proposed block plan (Source: Applicant)

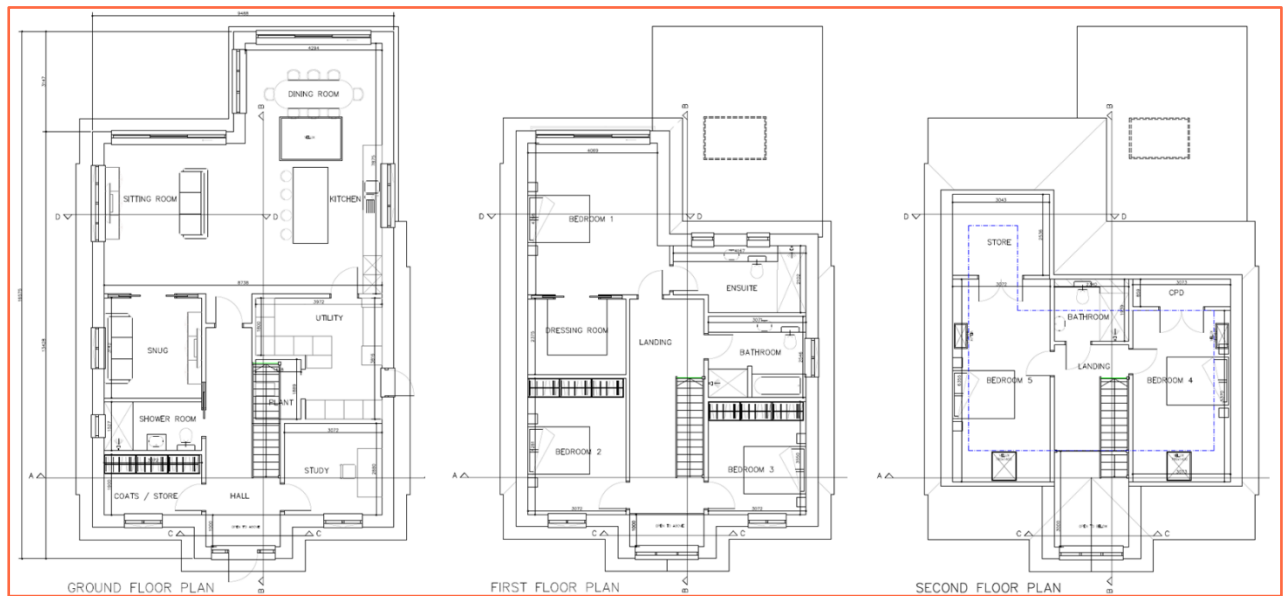


Figure 10: Proposed floor plans (Source: Applicant)

5. Flood Risk Assessment

EA Flood Zones:

- 5.1. Within planning, Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's website.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: - land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or - land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 1: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

- 5.2. The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

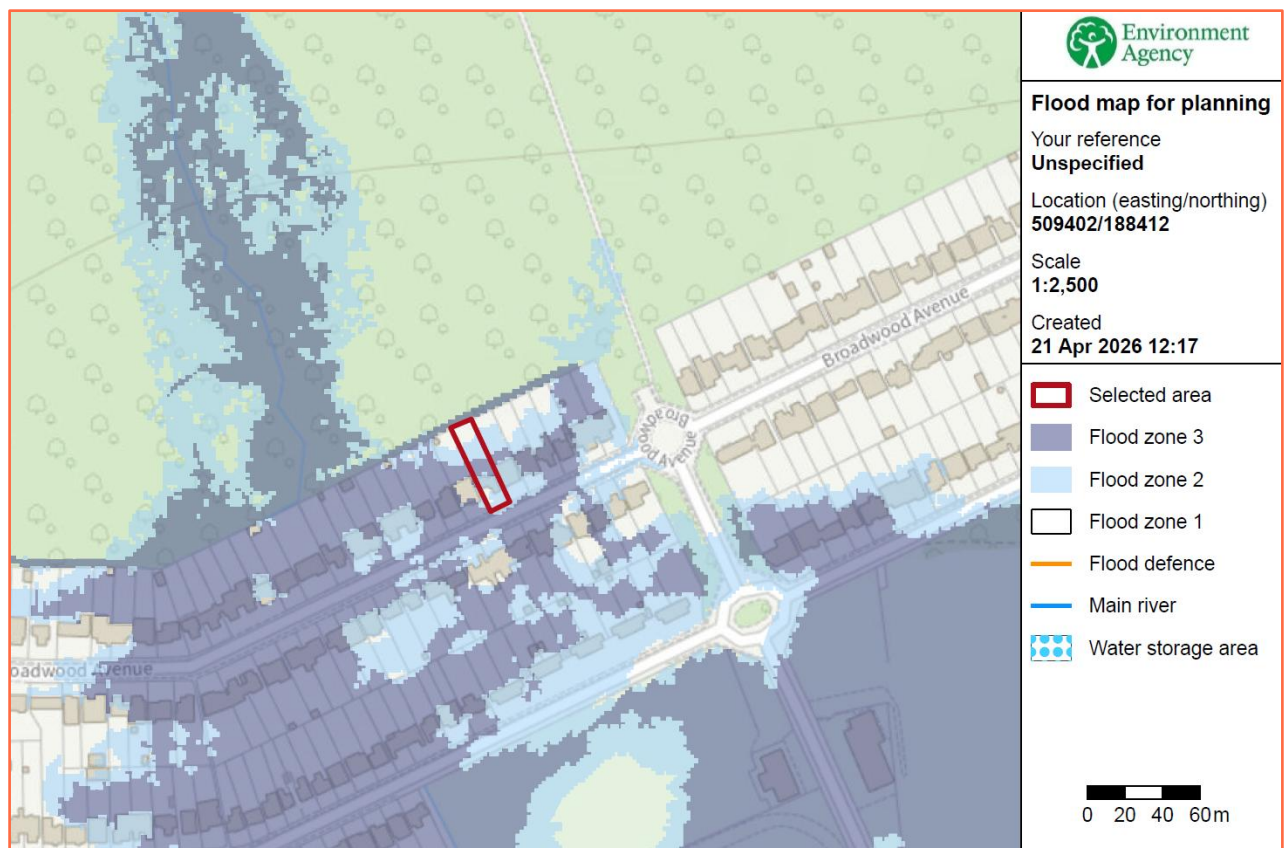


Figure 11: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

- 5.3. The site is located partially within Flood Zone 1 (Low Probability), defined as land having a less than 1 in 1,000 annual probability of river and sea flooding, partially within Flood Zone 2 (Medium Probability), defined as land having between a 1 in 1000 and 1 in 100 annual probability of river and sea flooding, and partially within Flood Zone 3 (High Probability), defined as having at least a 1 in 100 annual probability of river and sea flooding.

EA Flood Zones plus Climate Change:

- 5.4. The Flood Zones plus climate change dataset shows how the combined extent of Flood Zones 2 and 3 could increase with climate change over the next century, ignoring the benefits of any existing flood defences. The EA have assumed no changes to flood defences or land-use that could occur in future. The effects of climate change on flood risk which may be seen in the future could be different to those currently considered.
- 5.5. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5.
- 5.6. The datasets shown on Flood Map for Planning are aimed at supporting planners and developers to make long-term decisions about the location and design of development and the use of land. Such decisions need to account for the full anticipated lifetime of the development being planned.
- 5.7. The EA have therefore chosen:
- The 'Central' allowance for the 2080s epoch (2070-2125) for risk of flooding from rivers
 - The 'Upper End' allowance for risk of flooding from the sea, accounting for cumulative sea level rise to 2125
- 5.8. The Flood Zones plus climate change dataset is created using local flood model outputs, recorded flood outlines and national flood model information, and by adding climate change scenarios from local and national modelling, using the maximum extents from:
- Rivers and sea with defences 3.3%, 1%/0.5% and 0.1% AEPs
 - Rivers and sea without defences 1%/0.5% and 0.1% AEPs
- 5.9. The extents are merged to create a single outline.
- 5.10. The site is shown to be partially within the EA Flood Zones plus climate change (2070 to 2125) extent.

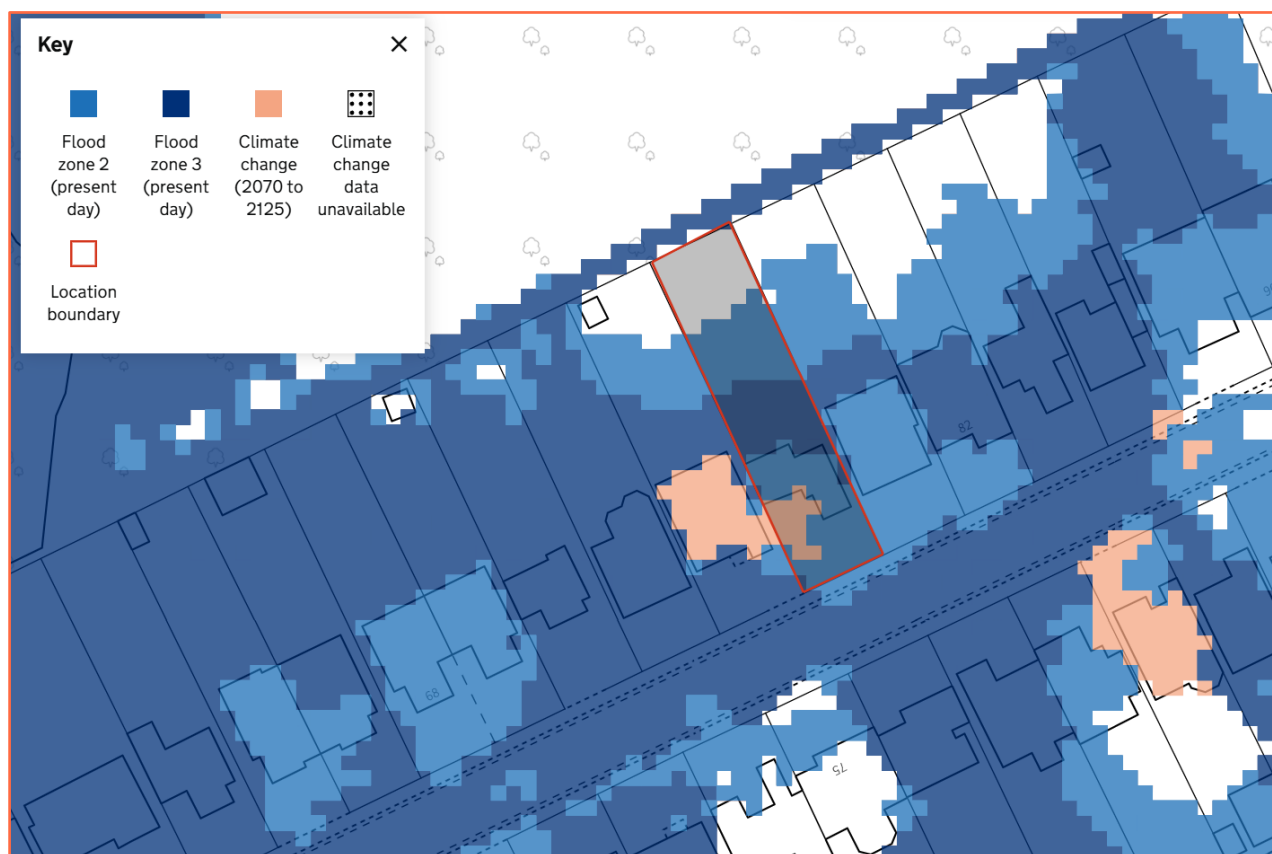


Figure 12: Environment Agency Flood Map for Planning – Flood Zones with Climate Change (Source: EA)

Alternative Flood Zones:

- 5.11. The West London Strategic Flood Risk Assessment (SFRA) adopts a definition for Flood Zone 3a that includes fluvial, tidal and surface water flood extents.
- 5.12. Flood Zone 3a is defined in the West London SFRA as:
- Land within EA modelled fluvial flood risk extents predicted for up to and including 1 in 100 year return period events – Flood Zone 3a (fluvial / tidal)
 - Land within EA modelled tidal flood risk extents predicted for up to and including 1 in 200 year return period events – Flood Zone 3a (fluvial / tidal)
 - Land within EA modelled surface water flood risk extents predicted for up to and including 1 in 100 year return period events – Flood Zone 3a (surface water)
- 5.13. According to the West London Strategic Flood Risk Assessment surface water flood maps the site is partially at a high, medium and low risk of flooding from surface water.

Fluvial (River Pinn):

- 5.14. The Pinn is a suburban, outer west London river. It has dendritic headwaters, the furthest is considered its source – in Harrow Weald. Its confluence with Frays River makes it a tributary of the Colne.

Detailed Flood Modelling:

- 5.15. Modelled flood levels and extents have been requested from the Environment Agency.

- 5.16. The EA has provided modelled flood data from the Pinn – Ruislip Park Wood and Pinn Meadows FAS flood model (also referred to as the Ruislip (Pinn) 2021 model).
- 5.17. Modelled flood extents have been provided for the present day, and modelled flood levels have been provided for the present day and climate change scenarios.
- 5.18. The whole site is shown to be outside of the modelled 1:20 year, 1:50 year and 1:100 year flood extents, with part of the site shown to be within the modelled 1:1000 year extent.

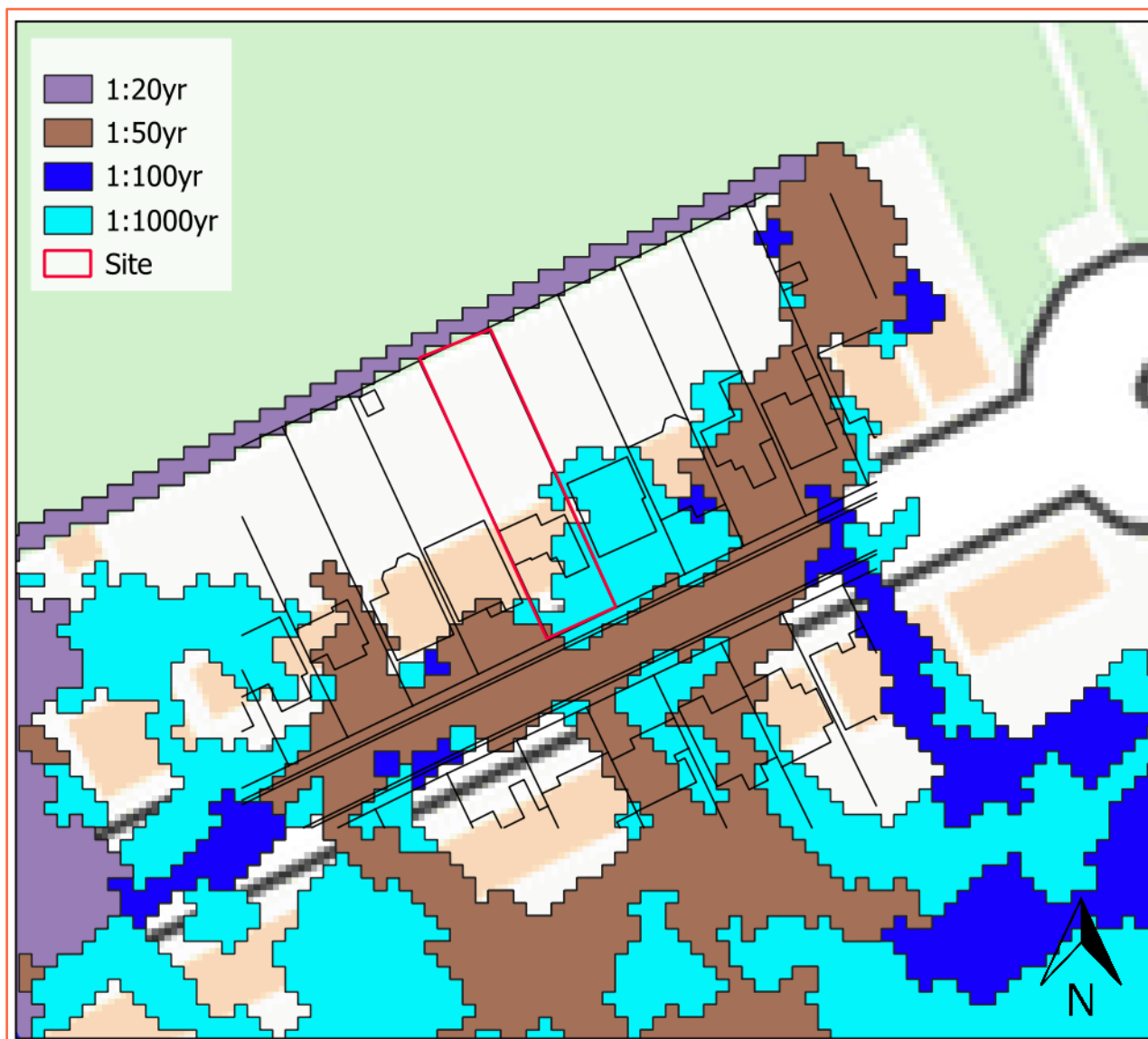


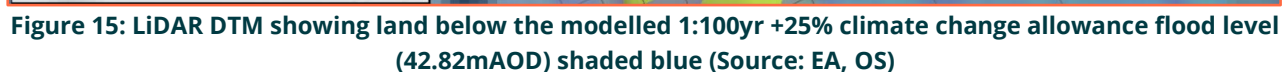
Figure 13: Modelled 1:20 year, 1:50 year, 1:100 year and 1:1000 year flood extents at the site (Source: EA, OS Mapping)

- 5.19. The Flood Risk Assessments: climate change allowances guidance states that for “More Vulnerable” development in Flood Zones 2 and 3, the Central allowance should be used.
- 5.20. The site falls within the Colne Management Catchment, where the Central allowance for the 2080’s is a 21% increase in flows. The Pinn Ruislip modelling includes the 1:100 year with 25% increase in flows, which will be used for this assessment.

-
- This topographic map shows a residential area with various elevation points marked by green dots. A red polygon highlights a specific area of interest, likely a proposed development or a specific lot. The map includes a road network, building footprints, and a green area in the upper left corner. The elevation points are labeled with numerical values, such as 42.74, 42.81, 42.85, 42.73, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.76, 42.82, 42.90, 42.91, 42.98, 42.97, 42.96, 42.90, 42.74, 41.99, 42.52, 42.59, 42.62, 42.63, 42.67, 42.71, 42.72, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 43.17, 43.14, 43.07, 43.01, 42.98, 42.89, 42.74, 42.59, 42.52, 42.63, 42.65, 42.69, 42.72, 42.71, 42.74, 42.77, 42.79, 42.78, 42.72, 42.64, 42.10, 42.96, 42.97, 42.98, 42.95, 42.89, 42.99, 43.03, 43.04, 43.03, 43.03, 43.03, 43.02, 43.04, 43.16, 43.17, 43.20, 43.24, 43.24, 43.23, 43.30, 43.26, 43.21, 4

5.23. Comparison of the modelled 1:100 year +25% climate change flood level (42.82mAOD) with topographic site levels (42.88mAOD to 43.30mAOD) shows that the site is entirely above the modelled 1:100 year plus climate change flood level.

5.24. The figure below shows land below the modelled 1:100yr +25% climate change allowance flood level (42.82mAOD) shaded blue.



- ## Flood Storage Areas:

- 5.27. According to EA data, there are no Flood Storage Areas located in close proximity to the site.

5.28. Flood defences are typically raised structures that alter natural flow patterns and prevent floodwater from entering property in times of flooding. They are generally categorised as either ‘formal’ or ‘informal’ defences. A ‘formal’ flood defence is a structure that was built specifically for the purpose of flood defence, and is maintained by its respective owner, which could be the EA, Local Authority, or an individual. An ‘informal’ flood defence is a structure that has not been specifically built to retain floodwater, and is not maintained for this specific purpose, but may afford some protection against flooding.

- Commercial in Confidence**

- 5.30. Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.
- 5.31. The site is not shown to benefit from the presence of flood defences.

Residual Risk (breach or overtopping of flood defences):

- 5.32. Breaching of flood defences can cause rapid inundation of areas behind flood defences as flow in the river channel discharges through the breach. A breach can occur with little or no warning, although they are much more likely to concur with extreme river levels or tides when the stresses on flood defences are highest. Flood water flowing through a breach will normally discharge at a high velocity, rapidly filling up the areas behind the defences, resulting in significant damage to buildings and a high risk of loss of life. Breaches are most likely to occur in soft defences such as earth embankments although poorly maintained hard defences can also be a potential source of breach.
- 5.33. Overtopping of flood defences occurs when water levels exceed the protection level of raised flood defences. The worst case occurs when the fluvial or tidal levels exceed the defence level as this can lead to prolonged flooding. Less severe overtopping can occur when flood levels are below defence levels, but wave action causes cyclic overtopping, with intermittent discharge over the crest level of the defence. Flood defences are commonly designed with a freeboard to provide protection against overtopping from waves. The risk from overtopping due to exceedance of the flood defence level is much more significant than the risk posed by wave overtopping. Exceedance of the flood defence level can lead to prolonged and rapid flooding with properties immediately behind the defences at highest risk.
- 5.34. The site is not shown to benefit from the presence of flood defences.

Pluvial (Surface Water):

Environment Agency Surface Water

- 5.35. Pluvial (surface water) flooding occurs when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.
- 5.36. The mapping below shows the Risk of Flooding from Surface Water (RoFSW). Please note that the EA do not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness in areas which may be at risk and may require additional investigation. This information tells you the flood risk of the land around a building, not the building itself.
- 5.37. The RoFSW products are an assessment of where surface water flooding may occur.
- 5.38. The mapping shows the following likelihood categories, for the present day risk of flooding from surface water, and the climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk.
- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any year.
 - Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year.
 - Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year.

- 5.39. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5. A near-term epoch (2040 – 2060 “2050s” epoch) and Central allowances are being used initially, to support short and medium-term decisions informed by the highest flood likelihood projections.
- 5.40. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “High” chance of flooding from surface water at the present day.
- 5.41. The EA Risk of Flooding from Surface Water mapping shows the site to be at “Very Low” to “High” chance of flooding between 2040 and 2060.

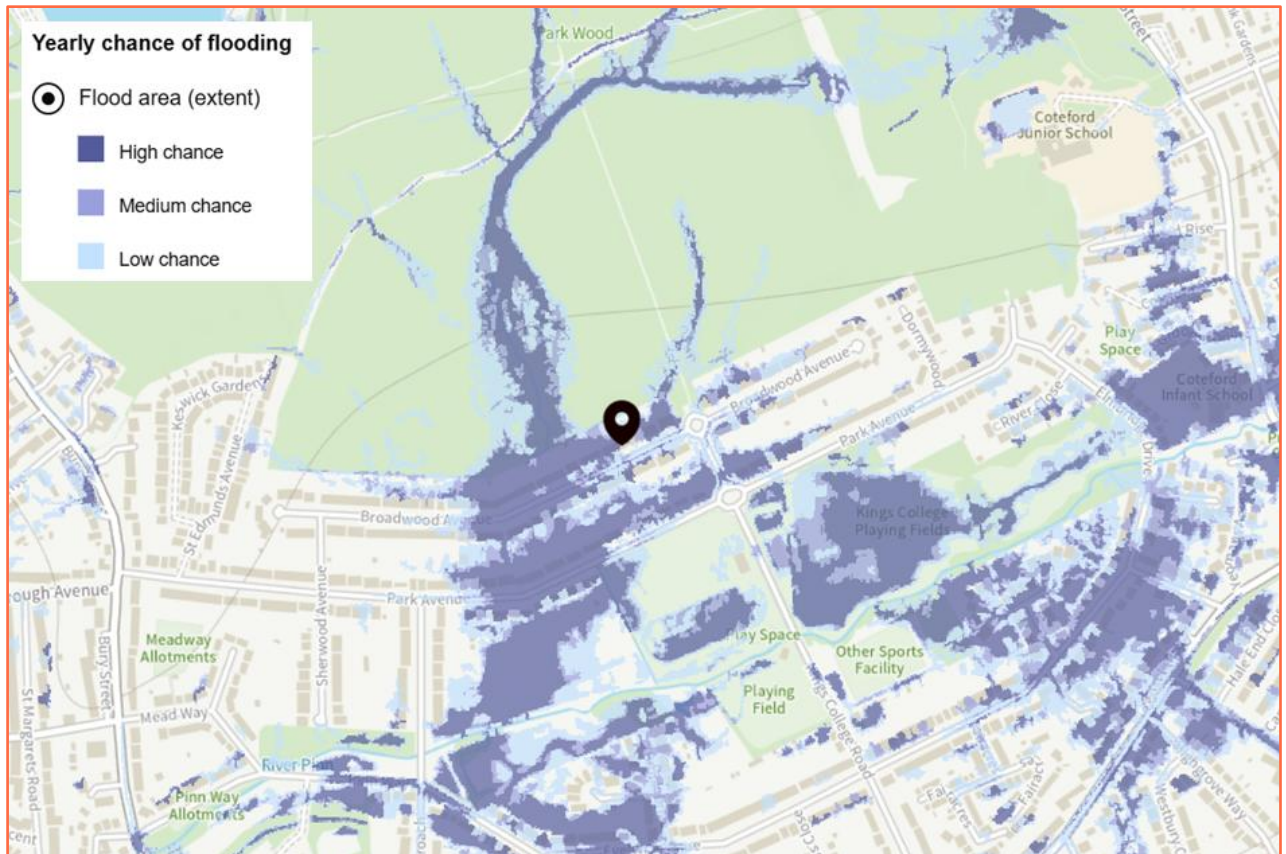


Figure 16: Extract from 2025 EA Risk of Flooding from Surface Water mapping – present day (Source: EA)

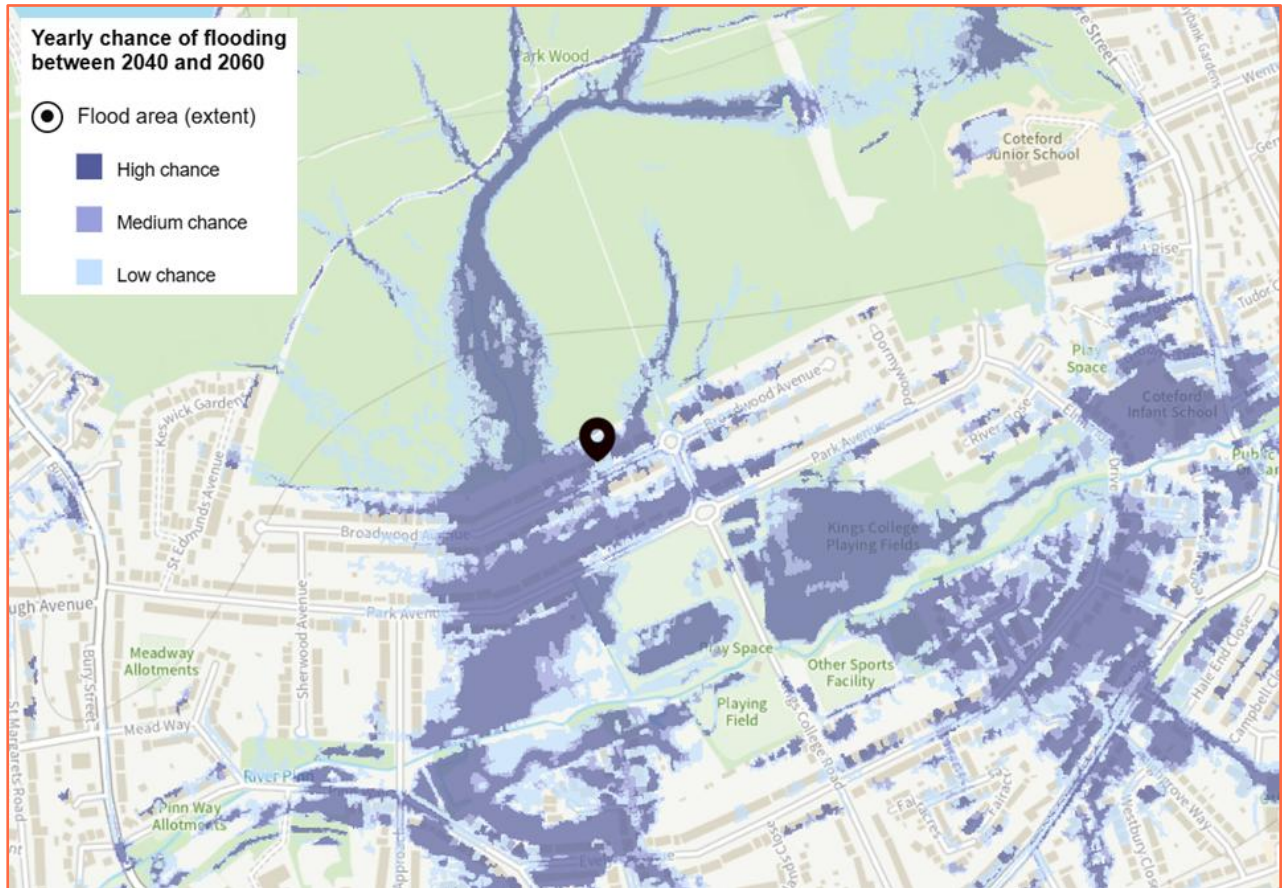


Figure 17: Extract from Environment Agency RoFSW map – between 2040 and 2060 (Source: EA)

West London SFRA Surface Water

- 5.42. The West London SFRA states that surface water flooding occurs as a result of high intensity rainfall when water is ponding or flowing over the ground surface before it enters the underground drainage network or a watercourse. Ordinary Watercourse flooding occurs under similar circumstances but is associated with non-main river watercourses or ditches. Surface water flooding is often exacerbated by the intensity or duration of the rainfall event overwhelming drainage points, leaving soil, drainage channels and other drainage systems incapable of draining water away at a sufficient rate. Extreme weather conditions can also lead to ordinary watercourses exceeding their capacity, overwhelming systems and causing water to flow onto land.
- 5.43. For the purposes of the SFRA, the risk of flooding from ordinary watercourses is covered within the 'surface water' terminology. This aligns with the inclusion of ordinary watercourse flood risks within the EA's Risk of Flooding from Surface Water mapping.
- 5.44. According to the West London SFRA surface water flood maps the site is at a very low to high risk of flooding.

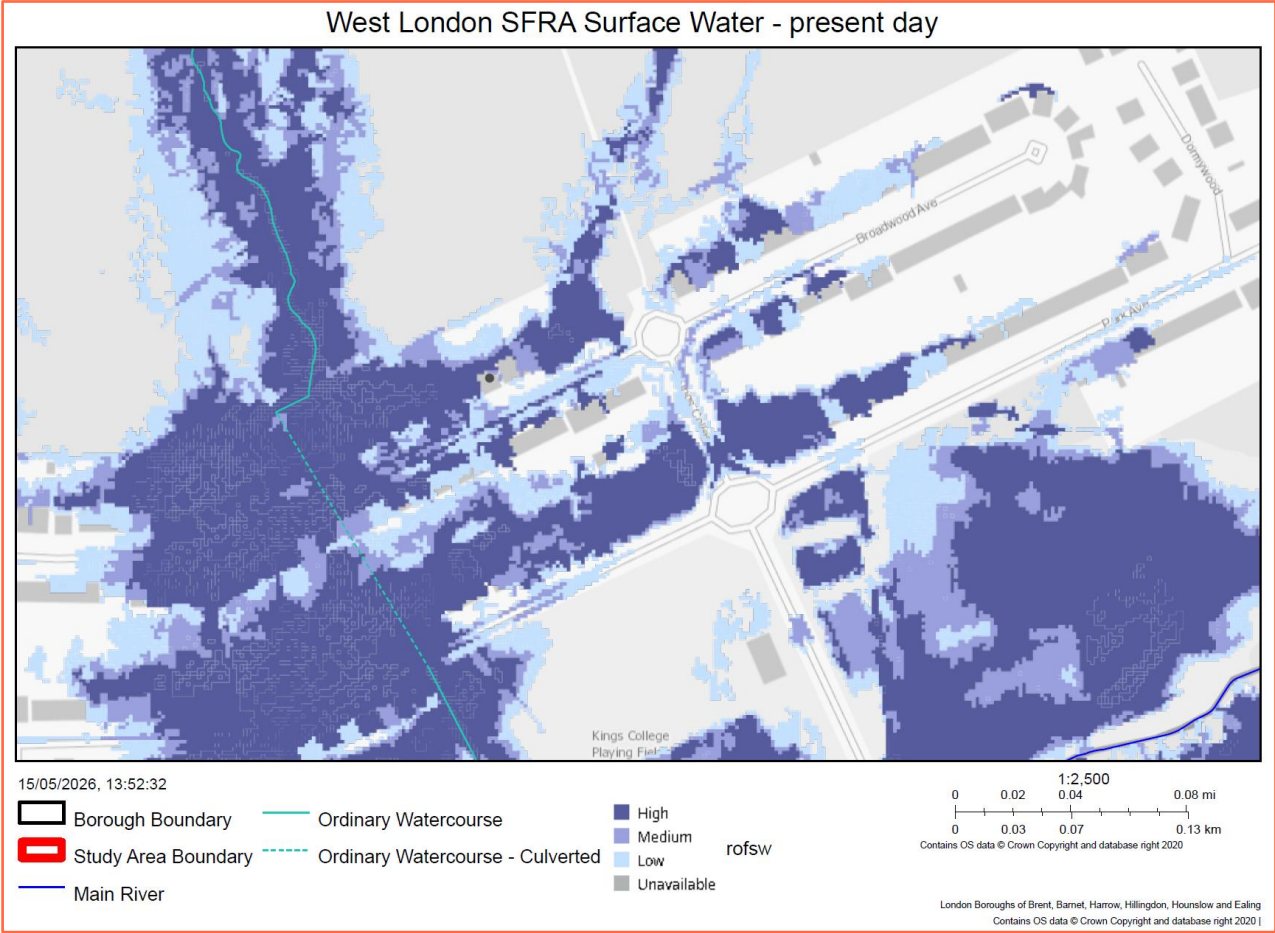


Figure 18: West London SFRA EA Surface Water Extent (Source: West London SFRA)

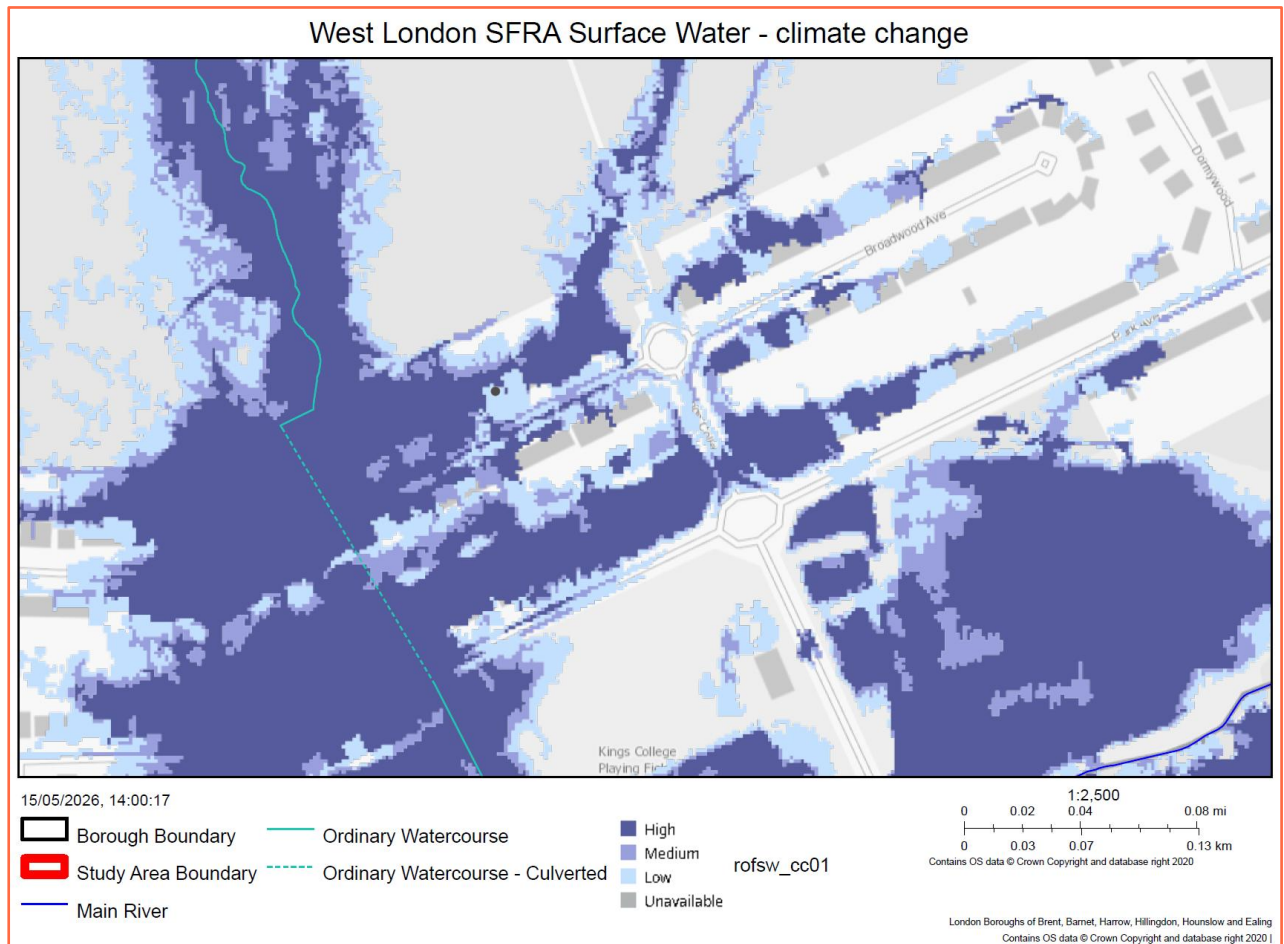


Figure 19: West London SFRA EA Surface Water Climate Change Extent (Source: West London SFRA)

Critical Drainage Areas:

- 5.45. A Critical Drainage Area (CDA) is an area that has critical drainage problems and which has been notified to the local planning authority as such by the Environment Agency in line with the National Planning Policy Framework (NPPF). In these locations, there is a need for surface water to be managed to a higher standard than normal to ensure any new development will contribute to a reduction in flooding risks in line with NPPF. These higher standards are determined by the Environment Agency.
- 5.46. The West London SFRA states that Critical Drainage Areas are defined as specific geographic areas (usually catchment areas) that have been identified as having multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) during heavy weather periods, leaving people, property and local infrastructure at risk. These areas are defined by a Borough's Surface Water Management Plan (SWMP) and does not include areas with critical drainage problems as designated by the EA.
- 5.47. The West London SFRA shows the site to be located within a Critical Drainage Area.

Groundwater:

- 5.48. Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

- 5.49. Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.
- 5.50. The West London SFRA shows the site lies within an area that has $\geq 25\%$ $< 50\%$ susceptibility to groundwater flooding (EA 2017), and is outside areas identified as at increase potential for elevated groundwater (GLA 2011).
- 5.51. No information has been provided to suggest that the site has flooded historically due to groundwater.

Sewer:

- 5.52. Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding. Temporary problems such as blockages, siltation, collapses and equipment or operational failures can also result in sewer flooding.
- 5.53. All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. The DG5 register records of flood incidents resulting in both internal property flooding and external flooding incidents. Once a property is identified on the DG5 register, water companies can typically put funding in place to address the issues and hence enable the property to be removed from the register. It should be noted that flooding from land drainage, highway drainage, rivers/watercourses and private sewers is not recorded within the register.
- 5.54. The West London SFRA shows the site to fall within a postcode area where there has been no reported incidents of sewer flooding from Thames Water (2017).
- 5.55. No information has been presented to suggest that the site itself has been affected by sewer flooding.

Other Sources:

- 5.56. Reservoirs with an impounded volume in excess of 25,000 cubic metres (measured above natural ground level) are governed by the Reservoirs Act and are listed on a register held by the Environment Agency. The site is located outside the maximum inundation extent on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely. There has been no loss of life in the UK from reservoir flooding since 1925. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. In accordance with the Reservoirs Act 1975 in England, these inspections are monitored and enforced by the EA themselves. The risk to the site from reservoir flooding is therefore minimal and is far lower than that relating to the potential for fluvial / tidal flooding to occur. The Environment Agency Reservoir Flood Map illustrated below, illustrates the largest area that might be flooded if the storage area were to fail and release the water it is designed to hold during a flood event.
- 5.57. Records of flooding from reservoirs and canals are erratic as there is no requirement for the Environment Agency to provide information on historic flooding from canals and raised reservoirs on plans. In particular, the NPPF does not require flood risk from canals and raised reservoirs to be shown on the Environment Agency flood zones.
- 5.58. Overflows from canals can be common as they are often fed by land drainage, and often do not have controlled overflow spillways. Occasionally, major bank breaches also occur, leading to rapid and deep flooding of adjacent land.
- 5.59. No information has been provided to suggest that the site is susceptible to flooding from other sources.

Historical Flood Events:

- 5.60. The EA hold records of historic flood events from rivers and the sea. The EA map flooding to land, not individual properties. Their historic flood event record outlines are an indication of the geographical extent of an observed flood event. Their historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.
- 5.61. The EA hold no records of historic flooding having affected the site.
- 5.62. The EA historical flood records are not comprehensive, and they advise that further enquiries locally are made with specific reference to flooding at the location.

6. Flood Risk Management

Vulnerability to Flooding:

- 6.1. The NPPF classifies property usage by vulnerability to flooding.
- 6.2. The existing site usage is classified as “more vulnerable” (residential).
- 6.3. Post development, the site will remain “more vulnerable” (residential), as the application is for a Replacement dwelling.
- 6.4. Accordingly, it is considered that the vulnerability of the site as a whole will not increase post development.

Physical Design Measures:

- 6.5. The site is located partially within Flood Zones 1, 2 and 3 according to the EA Flood Map for Planning (Rivers and the Sea) and within the EA Flood Zones plus climate change (2070 to 2125) extent however the whole site is shown to be above the modelled 1:100 year plus 25% climate change fluvial flood level.
- 6.6. Comparison of modelled flood levels with topographic site levels has shown that the entire site is above the modelled 1:100 year +25% climate change flood level.
- 6.7. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “High” chance of flooding from surface water both at the present day and with climate change (2040 to 2060).
- 6.8. Overlaying the EA’s flood extents for the Risk of Flooding from Surface Water with climate change shows that the site is partially within the 1:30 year (High), 1:100 year (Medium) and 1:1000 year (Low) extents with climate change.
- 6.9. For the key Medium flood likelihood category with climate change (Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year, between 2040 and 2060) the maximum flood depth in the area of the proposed replacement dwelling is shown to be 0.2m.
- 6.10. Based on the plans provided, the finished floor level of the proposed replacement dwelling is shown to be 205mm (0.205m) above adjacent external site level.
- 6.11. The EA Standing Advice states that the design should be appropriately flood resistant and resilient by:
 - Using flood resistant materials that have low permeability to at least 600mm above the estimated flood level;
 - Making sure any doors, windows or other openings are flood resistant to at least 600mm above the estimated flood level;
 - Using flood resilient materials (for example lime plaster) to at least 600mm above the estimated flood level;
 - By raising all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level;
 - Making it easy for water to drain away after flooding such as installing a sump and a pump;
 - Making sure there is access to all spaces to enable drying and cleaning;
 - Ensuring that soil pipes are protected from back-flow such as by using non-return valves.
- 6.12. To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the development where practical and feasible, in consultation with the Local Authority building control department. These measures can include the following:
 - Solid concrete ground floor slab, with waterproof membrane;

- Closed-cell foam used in wall cavities;
- Waterproof ground floor internal render;
- Waterproof screed used on ground floors;
- Damp proof membranes;
- External walls rendered resistant to flooding to at least 600mm above ground floor level;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Raised wiring and power outlets at least 600mm above ground floor level;
- Ground floor electrical main ring run from first floor level; and on separately switched circuit from first floor;
- Electrical incomer and meter situated at least 600mm above ground floor level;
- Boilers, control and water storage / immersion installed at least 600mm above ground floor level;
- Gas meter installed at least 600mm above ground floor level;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured.
- Kitchen units of solid, water resistant material at ground floor level;
- Use of MDF carpentry (i.e. skirting, architrave, built-in storage) avoided at ground floor level;
- Stairs of solid hardwood construction with wood faces treated to resist water penetration at ground floor level.

- 6.13. It is recommended that flood proof doors and windows are installed for all ground floor external doors and windows.

Safe Escape:

- 6.14. The Flood Risk and Coastal Change Planning Practice Guidance (PPG) states that access considerations should include the voluntary and free movement of people during a design flood, as well as the potential for evacuation before a more extreme flood, considering the effects of climate change for the lifetime of the development. Emergency access and escape plans are needed if any part of a development is below the estimated design flood level, which connects the site to an area away from current or future flood risk.
- 6.15. It should be noted that the application is for a replacement dwelling. There will be no additional or separate units or dwellings introduced as part of the development.
- 6.16. In case of an extreme flood event without warning, residents and users should seek refuge on the upper floors of the building. The applicant has agreed that a permanent means of internal access will be provided to the first floor of the building, thus providing safe refuge.
- 6.17. Residents will follow the Flood Warning and Evacuation Plan detailed in the following section.

Flood Warning:

- 6.18. The EA is responsible for issuing flood warnings. Flood warnings are issued to the emergency services and local authorities. Both private individuals and organisations can sign-up to receive warnings via phone, text or email. This system of receiving warnings is currently voluntary.
- 6.19. Advice regarding severe flood warnings will generally be given during weather forecasts on local radio and TV. In the case of extreme events, warnings can also be disseminated via door to door visits by the police or locally appointed flood wardens.
- 6.20. The applicant has agreed to subscribe to the EA's flood warning service. The site lies within the River Pinn at Ruislip Flood Warning Area.
- 6.21. The EA issue flood warnings/alerts to specific areas when flooding is expected.

Flood Warning	Flood Alert	Flood Warning	Severe Flood Warning
			
What it means?	Flooding is possible. Be prepared.	Flooding is expected. Immediate action required.	Severe flooding. Danger to life.
When it's used?	Two hours to two days in advance of flooding.	Half an hour to one day in advance of flooding.	When flooding poses a significant threat to life.
What to do?	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast on our website.	Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.

Table 2: EA Flood Warning Service

- 6.22. As the UK's official weather service, the Met Office is responsible for issuing weather warnings, which warn of impacts caused by severe weather. The Met Office provide warnings up to seven days ahead for rain, thunderstorms, wind, snow, lightning, ice and fog.
- 6.23. Met Office weather warnings are available in a number of ways, which make it easy to get the very latest information wherever you are. These include the Met Office app and website, social media, email alerts, TV, radio and RSS.
- 6.24. It is recommended that the site owner sign up to the National Severe Weather Warning Service. More information can be found here: <https://www.metoffice.gov.uk/weather/guides/warnings>.
- 6.25. The Met Office issues weather warnings, through the National Severe Weather Warning Service, when severe weather has the potential to bring impacts to the UK. These warnings are given a colour (yellow, amber or red) depending on a combination of both the impact the weather may have and the likelihood of those impacts occurring.

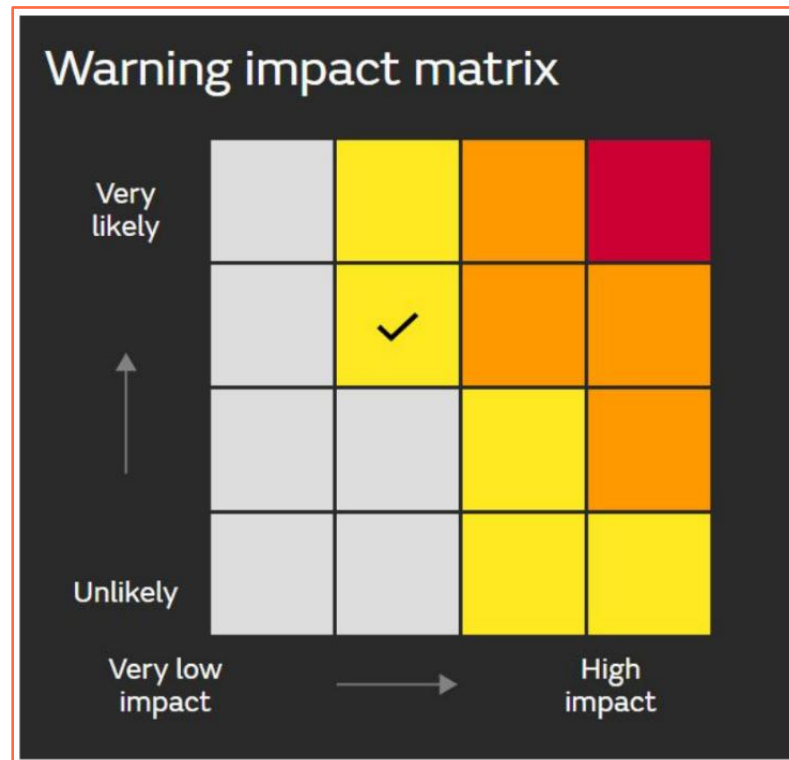


Figure 20: Met Office Weather Warning Impact Matrix (Source: Met Office)

- 6.26. **Yellow Warning:** Yellow warnings can be issued for a range of weather situations. Many are issued when it is likely that the weather will cause some low level impacts, including some disruption to travel in a few places. Many people may be able to continue with their daily routine, but there will be some that will be directly impacted and so it is important to assess if you could be affected. Other yellow warnings are issued when the weather could bring much more severe impacts to the majority of people but the certainty of those impacts occurring is much lower. It is important to read the content of yellow warnings to determine which weather situation is being covered by the yellow warning.
- 6.27. **Amber Warning:** There is an increased likelihood of impacts from severe weather, which could potentially disrupt your plans. This means there is the possibility of travel delays, road and rail closures, power cuts and the potential risk to life and property. You should think about changing your plans and taking action to protect yourself and your property. You may want to consider the impact of the weather on your family and your community and whether there is anything you need to do ahead of the severe weather to minimise the impact.
- 6.28. **Red Warning:** Dangerous weather is expected and, if you haven't already done so, you should take action now to keep yourself and others safe from the impact of the severe weather. It is very likely that there will be a risk to life, with substantial disruption to travel, energy supplies and possibly widespread damage to property and infrastructure. You should avoid travelling, where possible, and follow the advice of the emergency services and local authorities.

Flood Plan:

- 6.29. It is recommended that the applicant and future owners, occupiers and Landlords of the property prepare a flood plan to protect life and property during a flood event:

Action	
Before a flood	- Find out if you are at risk of flooding. - Find out if you can receive flood warnings. - Prepare and keep a list of all your important contacts to hand or save them on your mobile phone. - Think about what items you can move now and what you would want to move to safety during a flood such as pets, cars, furniture, and electrical equipment. - Know how to turn off gas, electricity and water supplies. - Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication. - Consider buying flood protection products such as flood boards and airbrick covers to help reduce flood water getting into your property.
During a flood	- Tune into your local radio station on a battery or wind-up radio. - Fill jugs and saucepans with water. - Grab your flood kit - if you have prepared one. - Collect blankets, torch, first aid kit, medication and food. - Move important documents, personal items, valuables, and lightweight belongings upstairs or to high shelves. - Raise large items of furniture, or put them in large bags if you have them. - Move people, outdoor belongings, cars and pets to higher ground. - Switch off water, gas and electricity at mains when water is about to enter your home. Do not touch sources of electricity when standing in water. - Fit flood protection products, if you have them, for example flood boards, airbrick covers, sandbags. - Put plugs in sinks and baths. Weigh them down with a pillowcase or plastic bag filled with soil. - If you do not have non-return valves fitted, plug water inlet pipes with towels or cloths. - Move your family and pets upstairs or to a high place with a means of escape. - Listen to the advice of the emergency service and evacuate if told to do so. - Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.
After a flood	- If you have flooded, contact your insurance company as soon as possible. - Take photographs and videos of your damaged property as a record for your insurance company. - If you don't have insurance, contact your local authority for information on grants and charities that may help you. - Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask. - Have your electrics, central heating and water checked by qualified engineers before switching them back on.

Table 3: Flood plan

Off-Site Impacts:

Fluvial Floodplain Storage:

- 6.30. The NPPF requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.
- 6.31. In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.

- 6.32. For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.
- 6.33. Comparison of modelled flood levels with topographic site levels has shown that the entire site is above the modelled 1:100 year +25% climate change flood level. As such, the proposed replacement dwelling will not result in an unacceptable loss of fluvial floodplain storage.

Surface Water Floodplain Storage:

- 6.34. Hillingdon's Core Strategy and the Joint West London SFRA 2018 commit to maintaining functional floodplain capacity; hence Hillingdon have a requirement for flood displacement storage for all developments identified within Surface Water Flood Zone 3a and Fluvial Flood Zone 3.
- 6.35. Compensatory flood storage (CFS) should be provided on level for level and volume for volume basis by gradually lowering ground levels, with flood water flowing freely out of the lowered area when flooding recedes.
- 6.36. The CFS should be positioned outside of (and contiguous with) the Flood Zone wherever possible.
- 6.37. The minimum volume of CFS to be provided will equate to the volume of flood water displaced by the proposed development.
- 6.38. CFS should be designed for a worst case scenario therefore the highest flood depth should be considered. i.e. the upper limit for each depth banding on the available flood map data.
- 6.39. For minor developments it is not considered practicable for the CFS volume to be calculated 'level for level'. Calculations are to be based on a constant depth of flood water over the entire area of the proposed structure within the floodplain. The figure used should be the upper limit of the relevant depth banding indicated on the available flood mapping.
- 6.40. The positioning of the CFS for minor developments is permissible within the Flood Zone where no practicable alternative exists.
- 6.41. The proposed application is for a Replacement dwelling. Based on the plans provided, the existing and proposed footprints are approximately 81.5m² and 155.6m² respectively.
- 6.42. Overlaying the EA's flood extents for the Risk of Flooding from Surface Water with climate change shows that the replacement dwelling is located within an area at "High" (1:30 year) to Low (1:1000 year) risk of flooding from surface water.
- 6.43. It is understood that the Medium (1 in 100 years) surface water event with climate change should be used. The 1:100 year climate change depth should be considered for floodplain compensation.

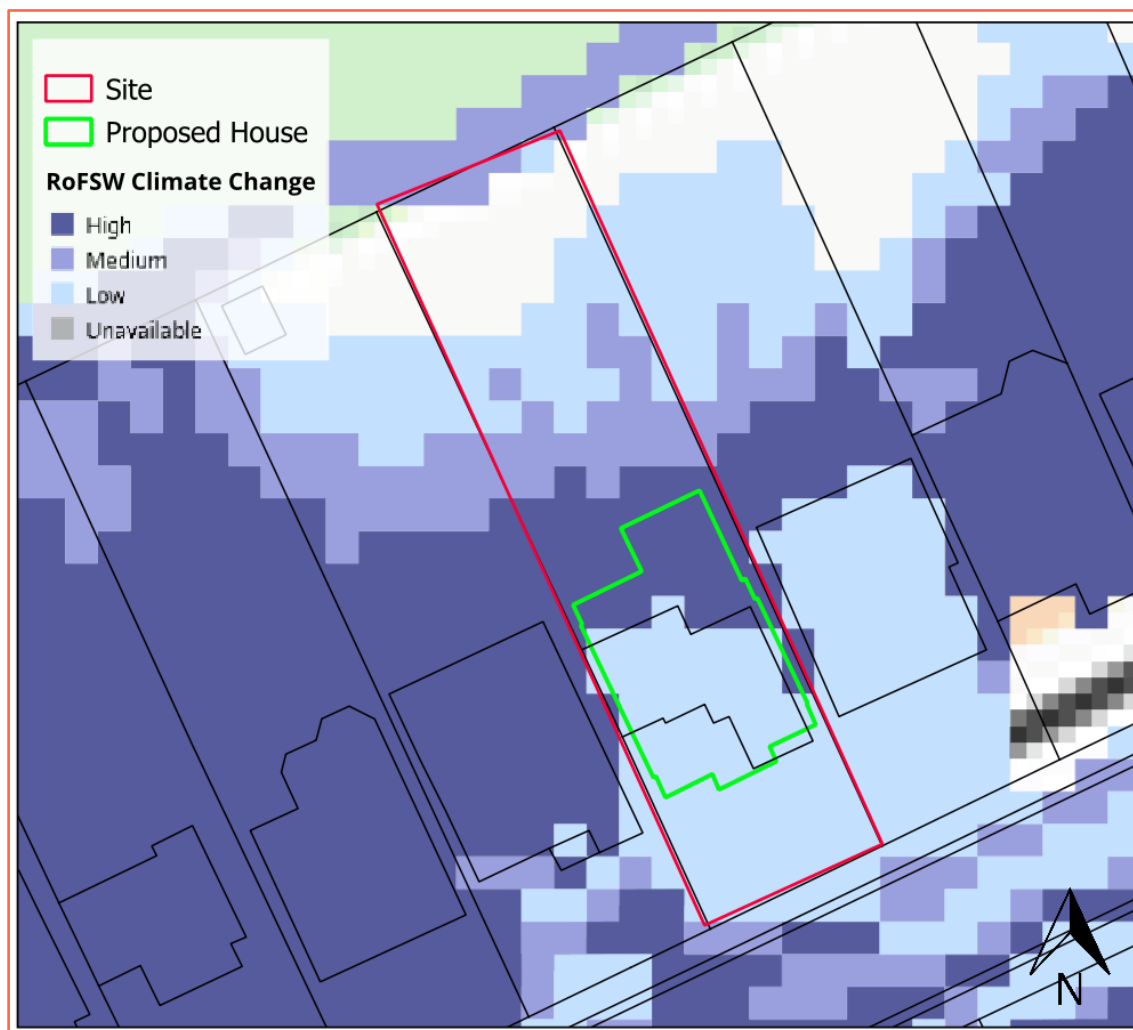


Figure 21: EA Surface Water Climate Change Extent overlain onto proposed site plan (Source: EA)

- 6.44. As such, flood depth mapping has been produced using the EA RoFSW climate change data (2040 – 2060).
- 6.45. For the key Medium flood likelihood category with climate change (Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year, between 2040 and 2060) the maximum flood depth in the area of the proposed replacement dwelling is shown to be 0.2m.
- 6.46. The probability of exceeding 0.3m on site is shown to be Low (less than 1 in 1000 chance of flooding in any given year). No flooding is shown on site for the 0.6m, 0.9m and 1.2m flood depths.

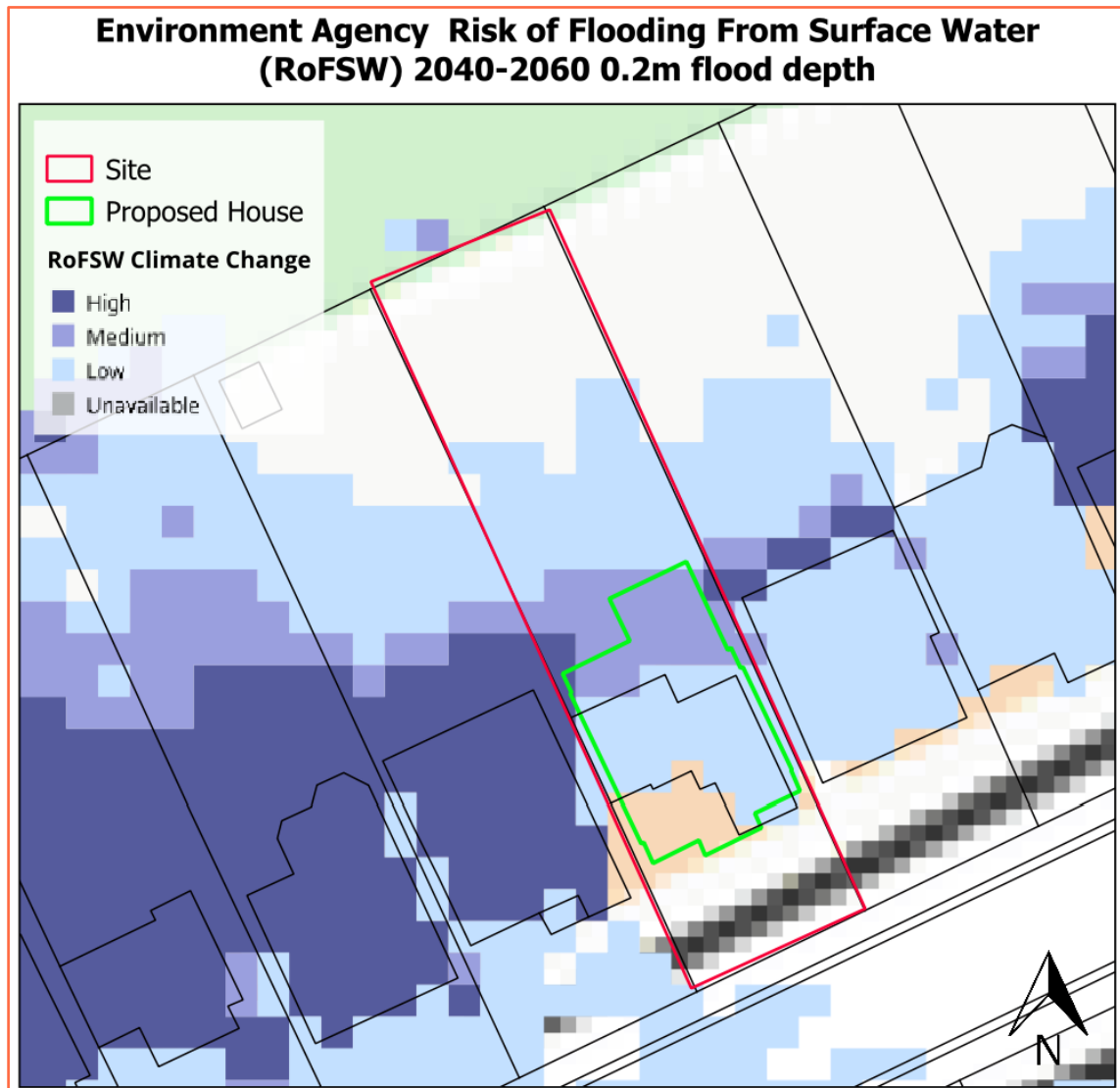


Figure 22: EA Surface Water Climate Change 0.2m flood depth (Source: EA)

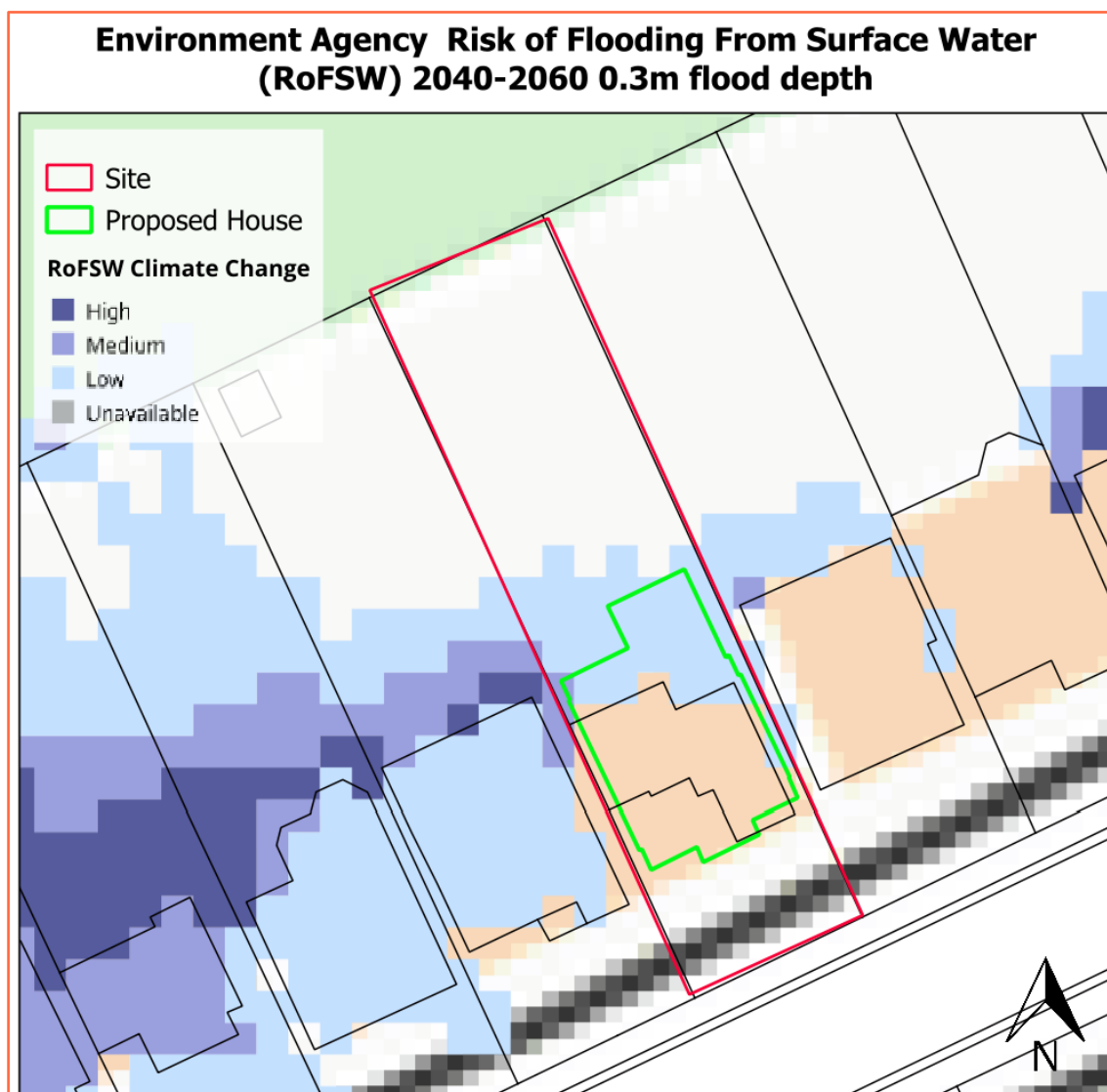


Figure 23: EA Surface Water Climate Change 0.3m flood depth (Source: EA)

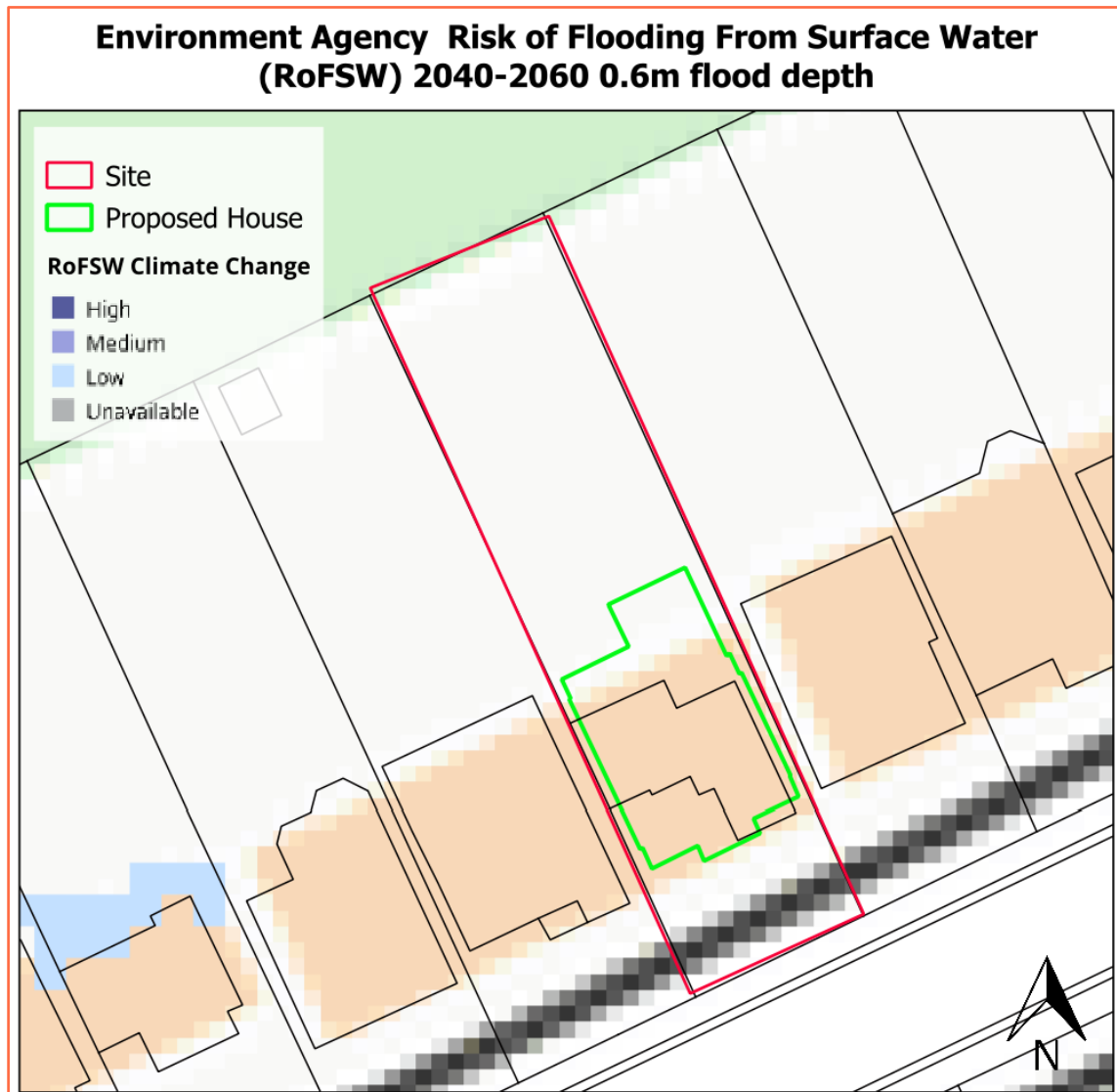


Figure 24: EA Surface Water Climate Change 0.6m flood depth (Source: EA)

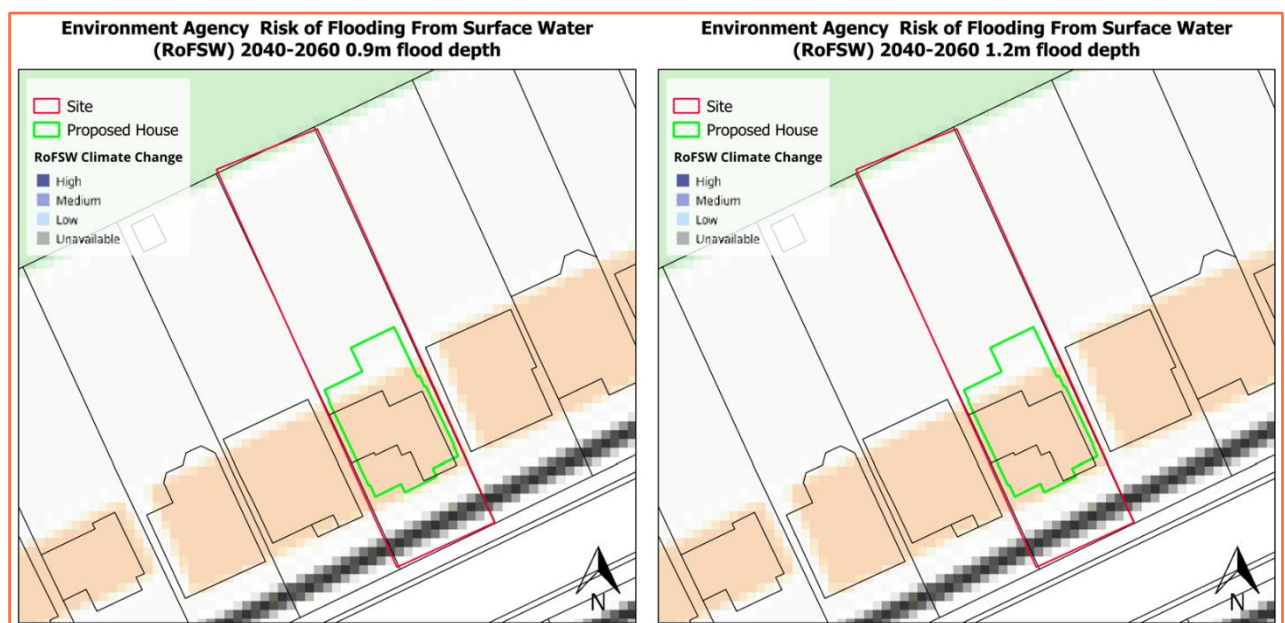


Figure 25: EA Surface Water Climate Change 0.9m and 1.2m flood depth (Source: EA)

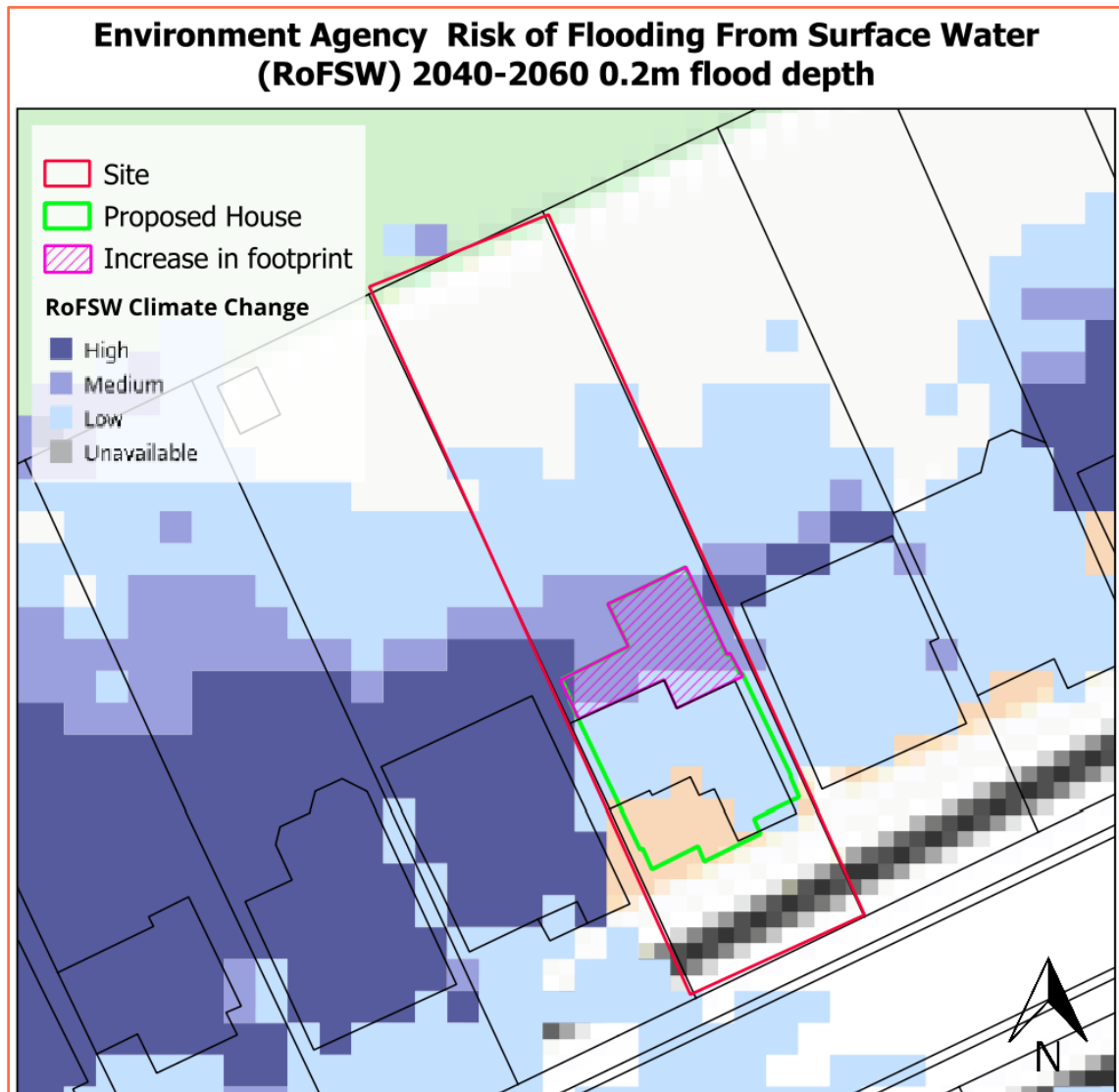


Figure 26: Area of increase in built footprint within 'Medium' extent for 0.2m flood depth (Source: EA)

- 6.47. The total area of the proposed increase in built footprint within the medium or high risk of flooding from surface water with climate change extents is 53.4m².
- 6.48. With a maximum flood depth of 200mm (0.20m), the total displacement of surface water caused by the development is 10.68m³.
- 6.49. As such, 10.68m³ of flood storage will need to be created on site to provide compensation for the loss in surface water floodplain.
- 6.50. As such, an area of the rear garden amounting to approximately 71.2m² would need to be lowered by 0.15m (15cm), to provide the flood storage required for compensation.
- 6.51. This area of lowered land is located outside of the modelled 1:100 year surface water flood extent (Medium), and is connected to the modelled 1:100 year (Medium) surface water extent. To maintain connectivity to the modelled 1:100 year surface water flood extent (Medium), an area of 90m² in total will be lowered by 0.15m.
- 6.52. The black hatched area, shown in the figure below, will be landscaped and uniformly lowered by a depth of 15cm (0.15m), avoiding existing trees on site, whilst providing the required surface water floodplain compensation.

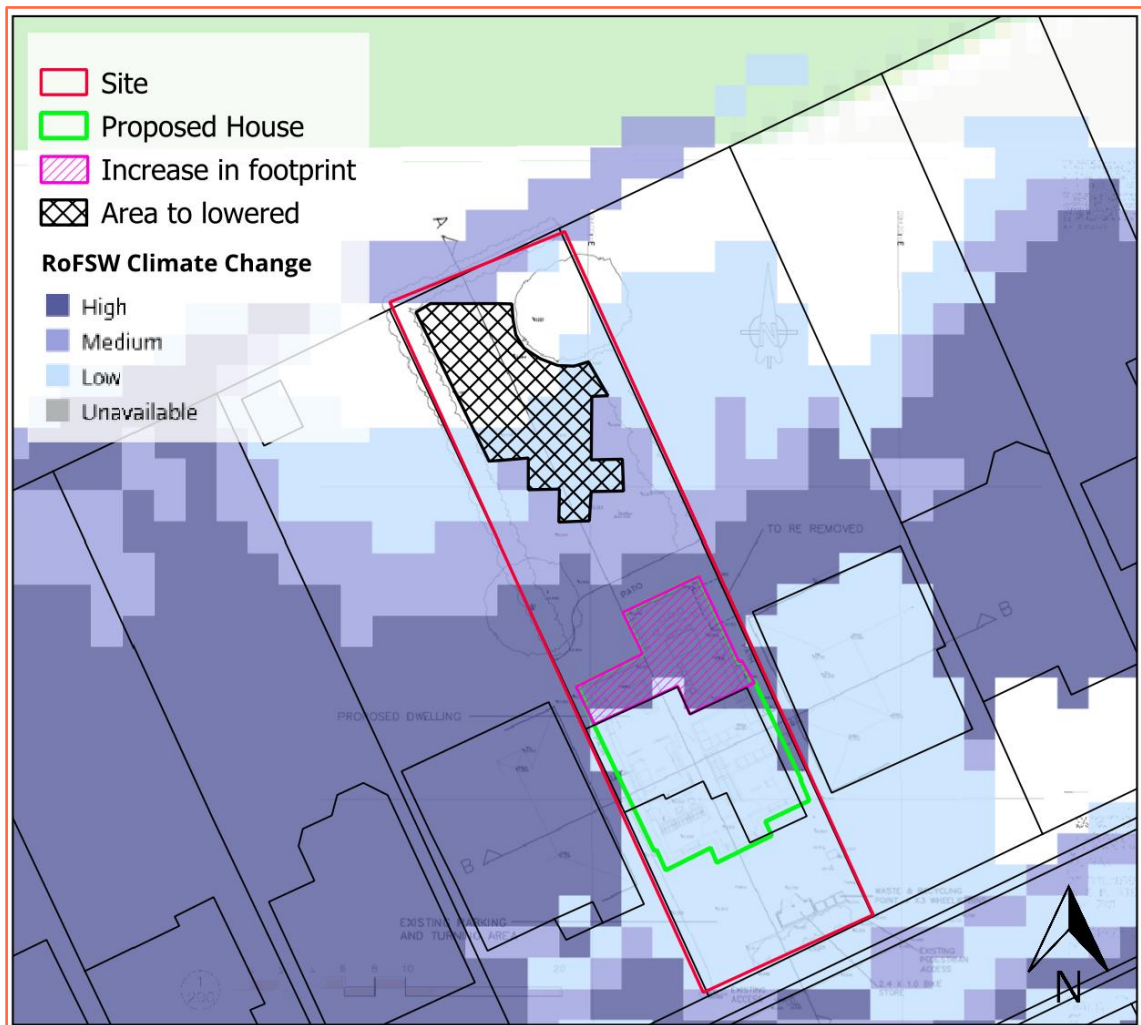


Figure 27: Proposed site plan showing proposed area of land to be lowered by 0.15m, to provide compensatory flood storage with RoFSW Climate Change extents overlain

7. Sequential and Exception Test

- 7.1. The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available.
- 7.2. The Sequential Test is applied to developments in areas identified as being at risk of any source of flooding now or in the future. The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.
- 7.3. The sequential approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding. Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk.
- 7.4. The site is located partially within Flood Zones 1, 2 and 3 according to the EA Flood Map for Planning (Rivers and the Sea) and within the EA Flood Zones plus climate change (2070 to 2125) extent however the whole site is shown to be above the modelled 1:100 year plus 25% climate change fluvial flood level.
- 7.5. Comparison of modelled flood levels with topographic site levels has shown that the entire site is above the modelled 1:100 year +25% climate change flood level.
- 7.6. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “High” chance of flooding from surface water both at the present day and with climate change (2040 to 2060).
- 7.7. Post development, the site will remain “more vulnerable”, as the application is for Replacement dwelling.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	X	Exception Test required	✓	✓
Zone 3b	Exception Test required	X	X	X	✓

Table 4: Flood risk vulnerability and flood zone ‘compatibility’ (Source: NPPF Table 3 Technical Guidance)

- 7.8. Using the table above, the proposed application (“more vulnerable”) is considered to be suitable within Flood Zones 1, 2 and 3, subject to passing the Sequential Test and Exception Test.
- 7.9. As the proposal is for the demolition of the existing house and erection of a replacement dwelling, finding an alternative site is not likely to be a realistic option.

8. Discussion and Conclusion

- 8.1. Unda Consulting Limited have been appointed by Mr David Rahman to undertake a Flood Risk Assessment for the proposed development at 78 Broadwood Avenue, Ruislip, HA4 7XR. The purpose of the study is to support a planning application for the proposed development.
- 8.2. The site is comprises of a two-storey residential dwelling. The surrounding area is characterised by residential properties.
- 8.3. The proposed application is for the Replacement dwelling.
- 8.4. The existing site usage is classified as “more vulnerable” (residential). Post development, the site will remain “more vulnerable” (residential). Accordingly, it is considered that the vulnerability of the site as a whole will not increase post development. There will be no additional or separate units or dwellings introduced as part of the development.
- 8.5. The site is located partially within Flood Zone 1 (Low Probability), defined as land having a less than 1 in 1,000 annual probability of river and sea flooding, partially within Flood Zone 2 (Medium Probability), defined as land having between a 1 in 1000 and 1 in 100 annual probability of river and sea flooding, and partially within Flood Zone 3 (High Probability), defined as having at least a 1 in 100 annual probability of river and sea flooding.
- 8.6. The EA has provided modelled flood data from the Pinn – Ruislip Park Wood and Pinn Meadows FAS flood model (also referred to as the Ruislip (Pinn) 2021 model).
- 8.7. Modelled flood extents have been provided for the present day, and modelled flood levels have been provided for the present day and climate change scenarios.
- 8.8. The whole site is shown to be outside of the modelled 1:20 year, 1:50 year and 1:100 year flood extents, with part of the site shown to be within the modelled 1:1000 year extent.
- 8.9. Modelled flood levels have been provided for areas of the floodplain. No modelled flood extent has been provided for the modelled 1:100 year +25% climate change event, and the site is entirely outside of the modelled flood levels provided for areas of the floodplain.
- 8.10. Comparison of the modelled 1:100 year +25% climate change flood level (42.82mAOD) with topographic site levels (42.88mAOD to 43.30mAOD) shows that the site is entirely above the modelled 1:100 year plus climate change flood level.
- 8.11. As such, the whole site is shown to be above the design flood level for planning (1:100 year plus 25% climate change).
- 8.12. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “High” chance of flooding from surface water at the present day.
- 8.13. The EA Risk of Flooding from Surface Water mapping shows the site to be at “Very Low” to “High” chance of flooding between 2040 and 2060.
- 8.14. Overlaying the EA’s flood extents for the Risk of Flooding from Surface Water with climate change shows that the site is partially within the 1:30 year (High), 1:100 year (Medium) and 1:1000 year (Low) extents with climate change.
- 8.15. For the key Medium flood likelihood category with climate change (Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year, between 2040 and 2060) the maximum flood depth in the area of the proposed replacement dwelling is shown to be 0.2m.
- 8.16. The West London SFRA shows the site to be located within a Critical Drainage Area.

- 8.17. The West London SFRA shows the site lies within an area that has $\geq 25\%$ $< 50\%$ susceptibility to groundwater flooding (EA 2017), and is outside areas identified as at increase potential for elevated groundwater (GLA 2011).
- 8.18. No information has been provided to suggest that the site has flooded historically due to groundwater.
- 8.19. The West London SFRA shows the site to fall within a postcode area where there has been no reported incidents of sewer flooding from Thames Water (2017).
- 8.20. No information has been presented to suggest that the site itself has been affected by sewer flooding.
- 8.21. The site is located outside the maximum inundation extent on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely.
- 8.22. The EA hold no records of historic flooding having affected the site.
- 8.23. Comparison of modelled flood levels with topographic site levels has shown that the entire site is above the modelled 1:100 year +25% climate change flood level. As such, the proposed replacement dwelling will not result in an unacceptable loss of fluvial floodplain storage.
- 8.24. Overlaying the EA's flood extents for the Risk of Flooding from Surface Water with climate change shows that the replacement dwelling is located within an area at "High" (1:30 year) to Low (1:1000 year) risk of flooding from surface water.
- 8.25. It is understood that the Medium (1 in 100 years) surface water event with climate change should be used. The 1:100 year climate change depth should be considered for floodplain compensation.
- 8.26. As such, flood depth mapping has been produced using the EA RoFSW climate change data (2040 – 2060).
- 8.27. For the key Medium flood likelihood category with climate change (Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year, between 2040 and 2060) the maximum flood depth in the area of the proposed replacement dwelling is shown to be 0.2m.
- 8.28. The probability of exceeding 0.3m on site is shown to be Low (less than 1 in 1000 chance of flooding in any given year). No flooding is shown on site for the 0.6m, 0.9m and 1.2m flood depths.
- 8.29. The total area of the proposed increase in built footprint within the medium or high risk of flooding from surface water with climate change extents is 53.4m².
- 8.30. With a maximum flood depth of 200mm (0.20m), the total displacement of surface water caused by the development is 10.68m³.
- 8.31. As such, 10.68m³ of flood storage will need to be created on site to provide compensation for the loss in surface water floodplain.
- 8.32. As such, an area of the rear garden amounting to approximately 71.2m² would need to be lowered by 0.15m (15cm), to provide the flood storage required for compensation.
- 8.33. This area of lowered land is located outside of the modelled 1:100 year surface water flood extent (Medium), and is connected to the modelled 1:100 year (Medium) surface water extent. To maintain connectivity to the modelled 1:100 year surface water flood extent (Medium), an area of 90m² in total will be lowered by 0.15m.
- 8.34. Based on the plans provided, the finished floor level of the proposed replacement dwelling is shown to be 205mm (0.205m) above adjacent external site level.

In Summary:

- The proposed application is for a Replacement dwelling.
- There will be no additional or separate units or dwellings introduced as part of the development.
- Internal access will be maintained from the ground floor to the upper floors of the building.
- Post development, the site will remain “more vulnerable” (residential).
- Flood proofing of the development will be incorporated as appropriate.
- There will be no unacceptable loss of fluvial or surface water floodplain storage.
- An area of the rear garden amounting to approximately 90m² would need to be lowered by 0.15m (15cm), to provide the flood storage required for compensation with connectivity to the modelled 1:100 year surface water flood extent (Medium).
- The applicant will register with the EA’s flood warning service (the site lies within the River Pinn at Ruislip Flood Warning Area), and the National Severe Weather Warning Service.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

**Unda Consulting Limited
May 2026**

Appendix

A – Development Plans:

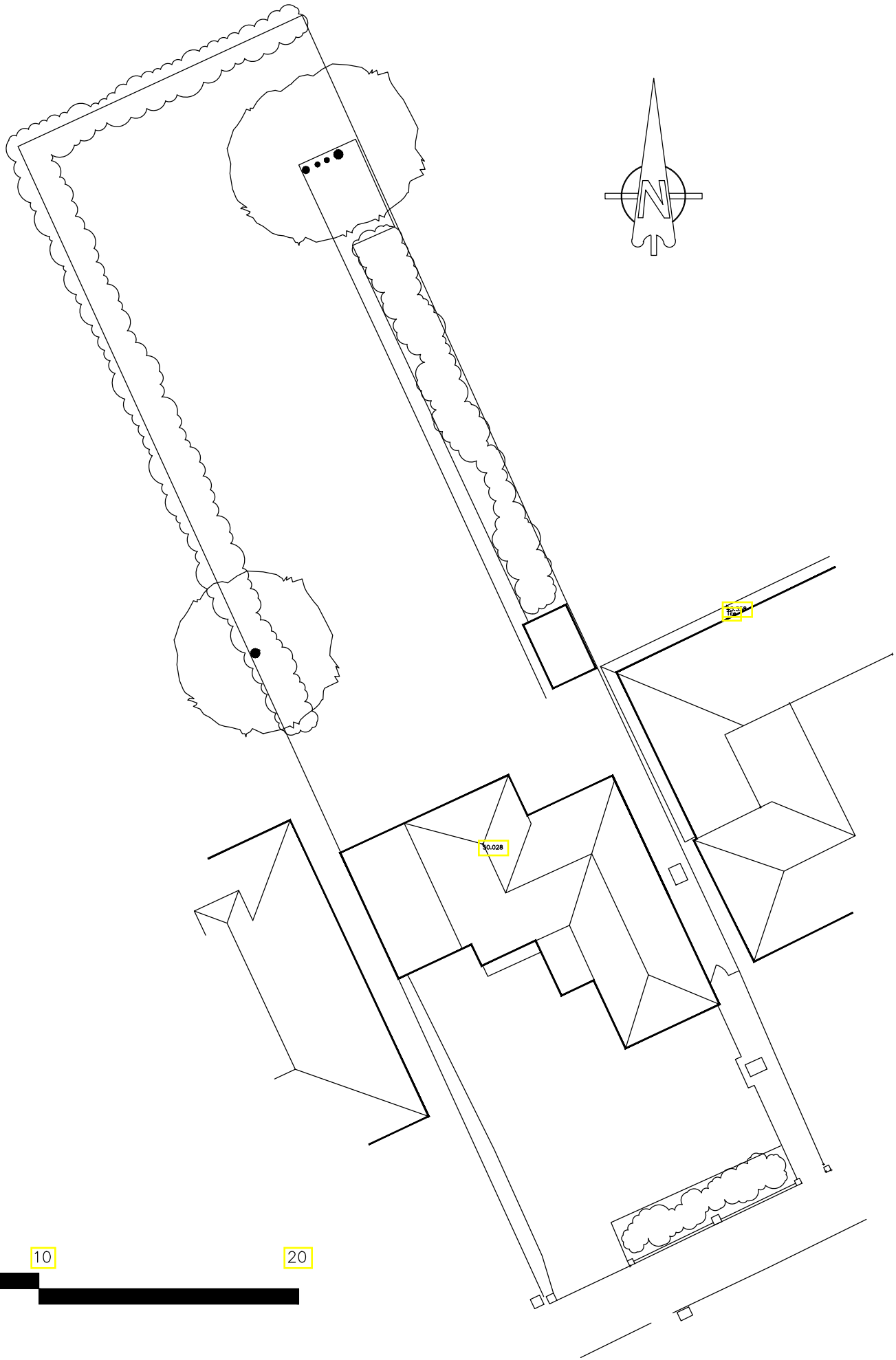
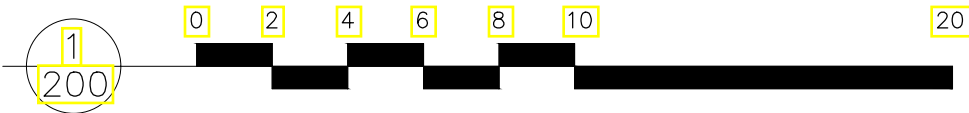
- Site location, existing and proposed plans – Applicant.

B – EA Flood Map for Planning:

- Flood Map for Planning – Environment Agency.

C – NPPF Annex 3:

- NPPF Annex 3: Flood risk vulnerability classification table



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FOR: **RAHMAN**

SITE: **78 BROADWAY AVENUE
RUISLIP, MIDDLESEX
HA4 7XR**

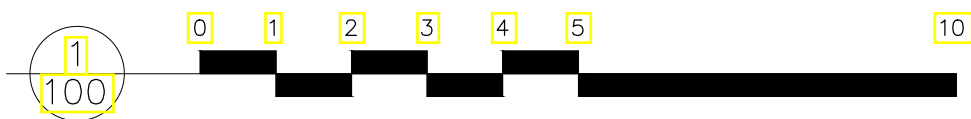
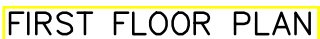
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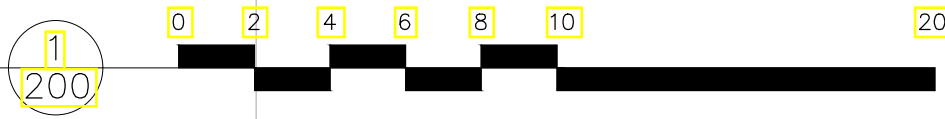
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TOTAL FLOOR AREA – 119.7 SQM



		
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FOR RAHMAN		
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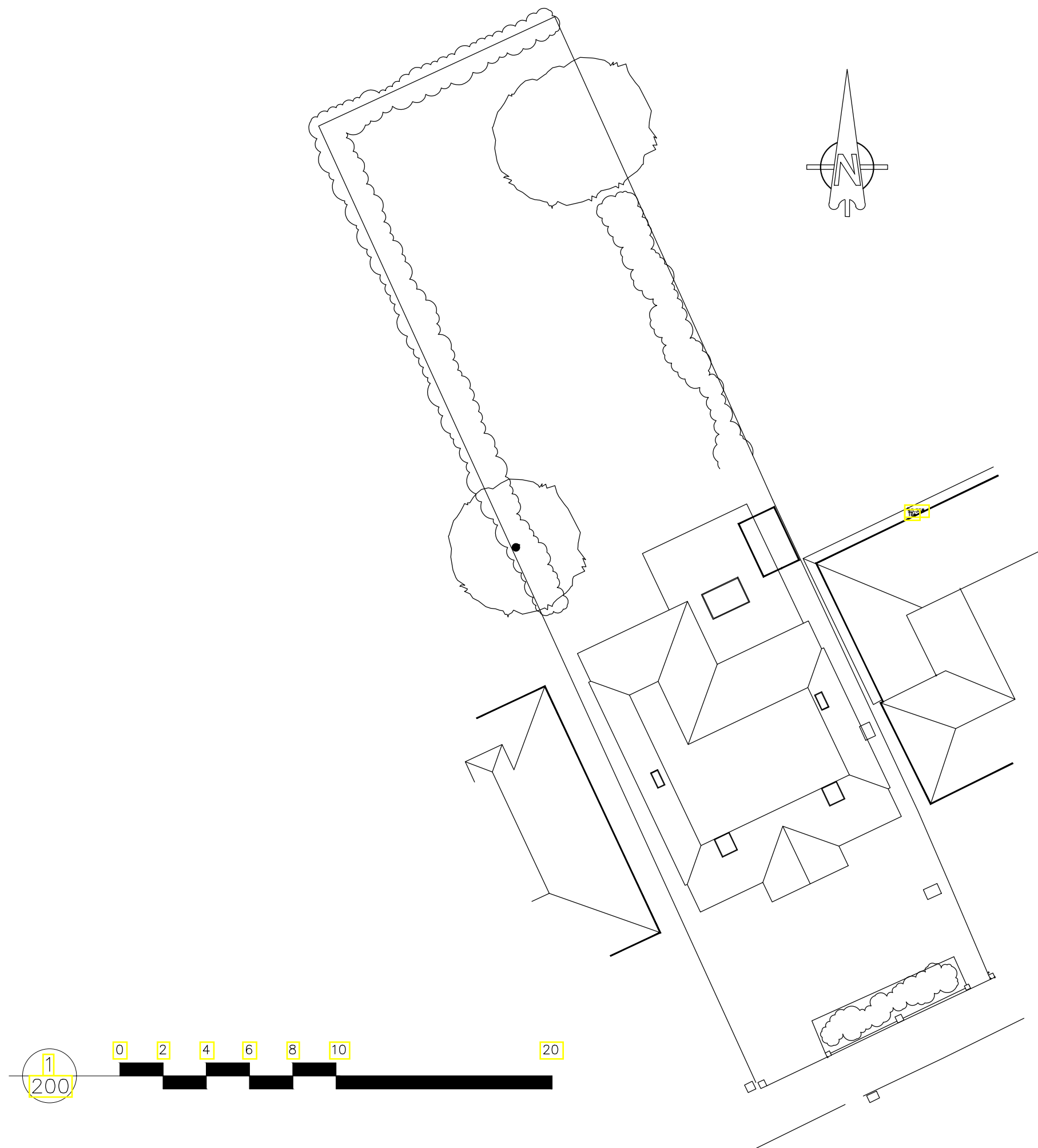
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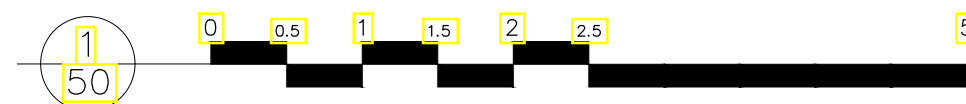
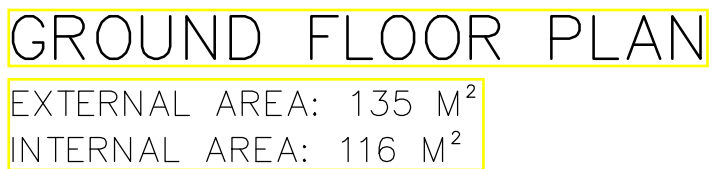
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PROPOSED DWELLING
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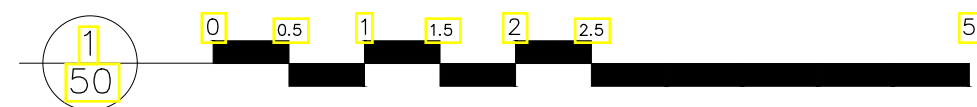
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B	SECOND ISSUE	7/10/25	JP	
C	GENERAL REVISIONS	11/25/25	JP	
D	GENERAL REVISIONS	5/3/26	JP	

[illegible]

EXTERNAL AREA: 104 M^2
INTERNAL AREA: 88 M^2



FOR
RAHMAN

TITLE
PROPOSED DWELLING

PROPOSED DWELLING FIRST FLOOR PLAN

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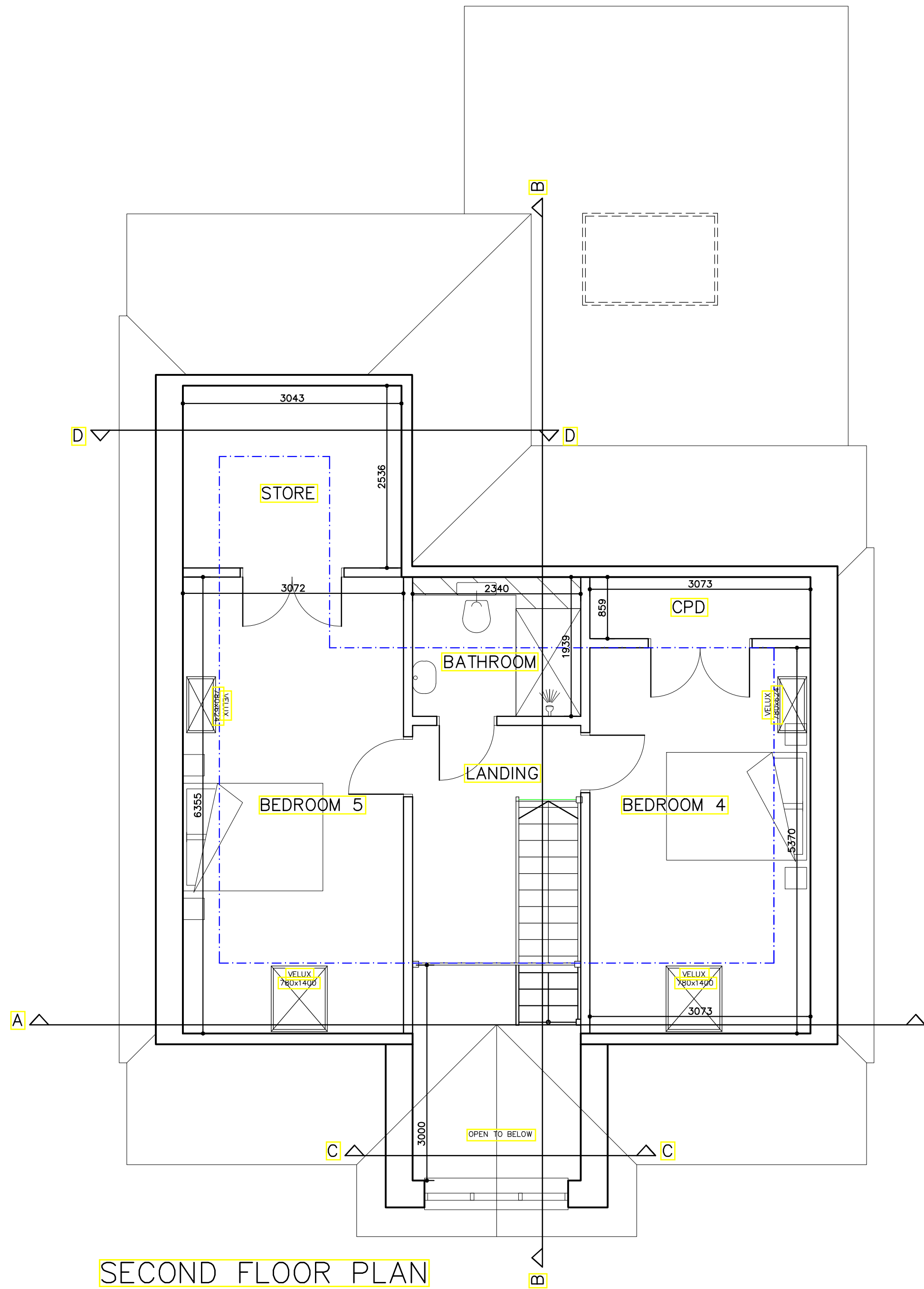
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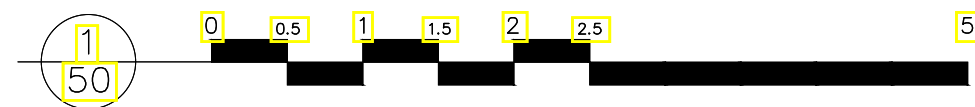
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REV D



SECOND FLOOR PLAN

EXTERNAL AREA: 72 M²
INTERNAL AREA: 62.5 M²



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B	SECOND ISSUE	7/10/25	JP	
C	GENERAL REVISIONS	11/25/25	JP	
D	GENERAL REVISIONS	5/3/26	JP	



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WEST SUSSEX, RH19 2LP : TEL 01342 838060

FOR: RAHMAN

SITE: 78 BROADWAY AVENUE
RUISLIP, MIDDLESEX
HA4 7XR

TITLE: PROPOSED DWELLING
SECOND FLOOR PLAN

C/No.	0/No.	SCALE
198150		1:50 @A2
DRAWN	DRAWING NUMBER	
JP		03B
DATE		REV D
1/7/25		

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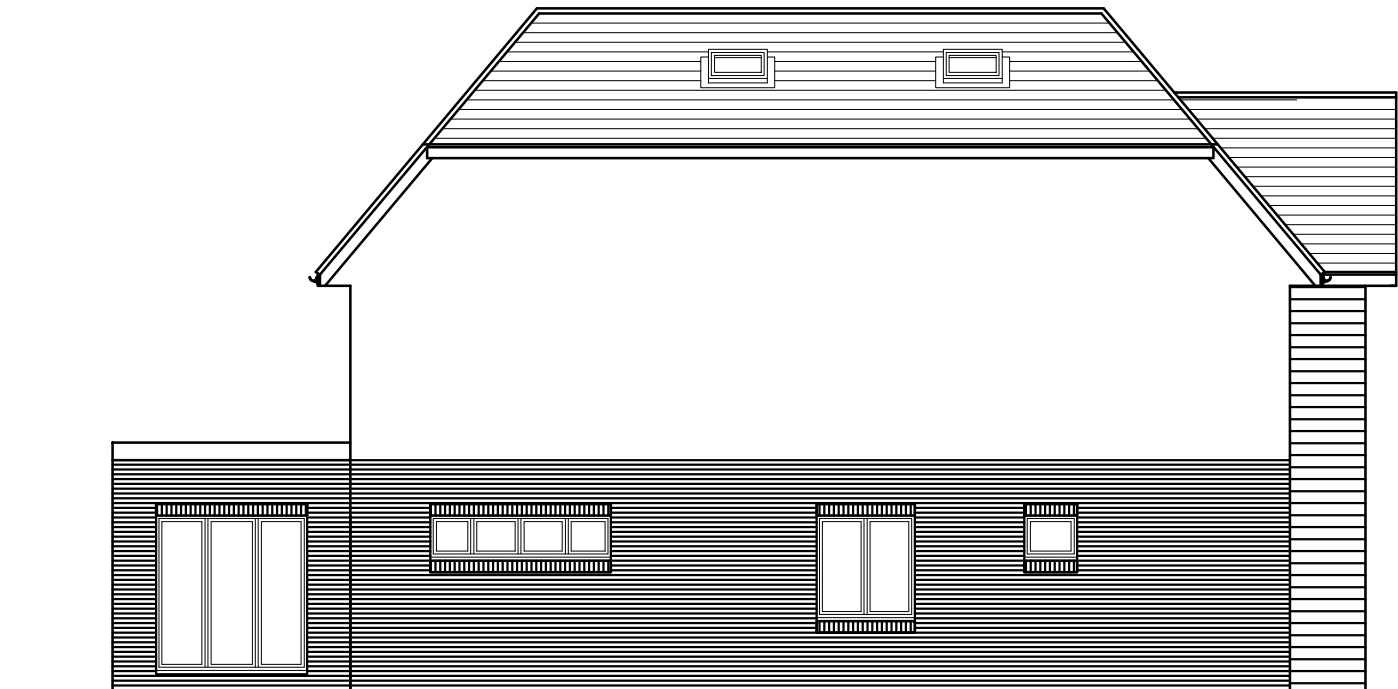
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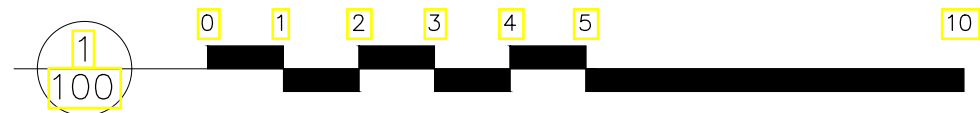
SIDE ELEVATIONS



REAR ELEVATION



SIDE ELEVATIONS





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FOR
RAHMAN

SITE
**78 BROADWAY AVENUE
RUISLIP, MIDDLESEX
HA4 7XR**

TITLE
**PROPOSED DWELLING
ELEVATIONS**

C/No.
198150

DRAWN
JP

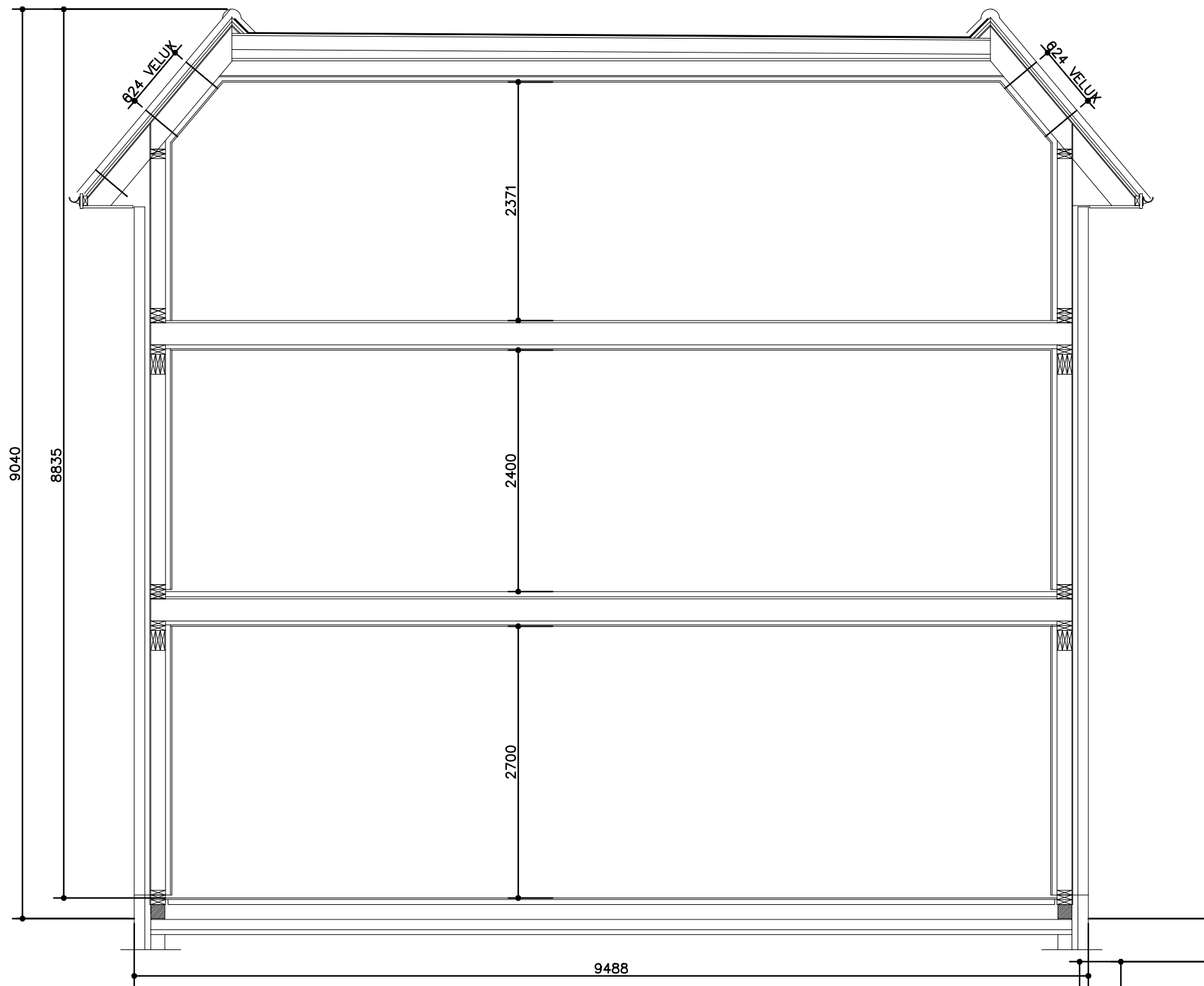
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1/7/25

O/No.
04

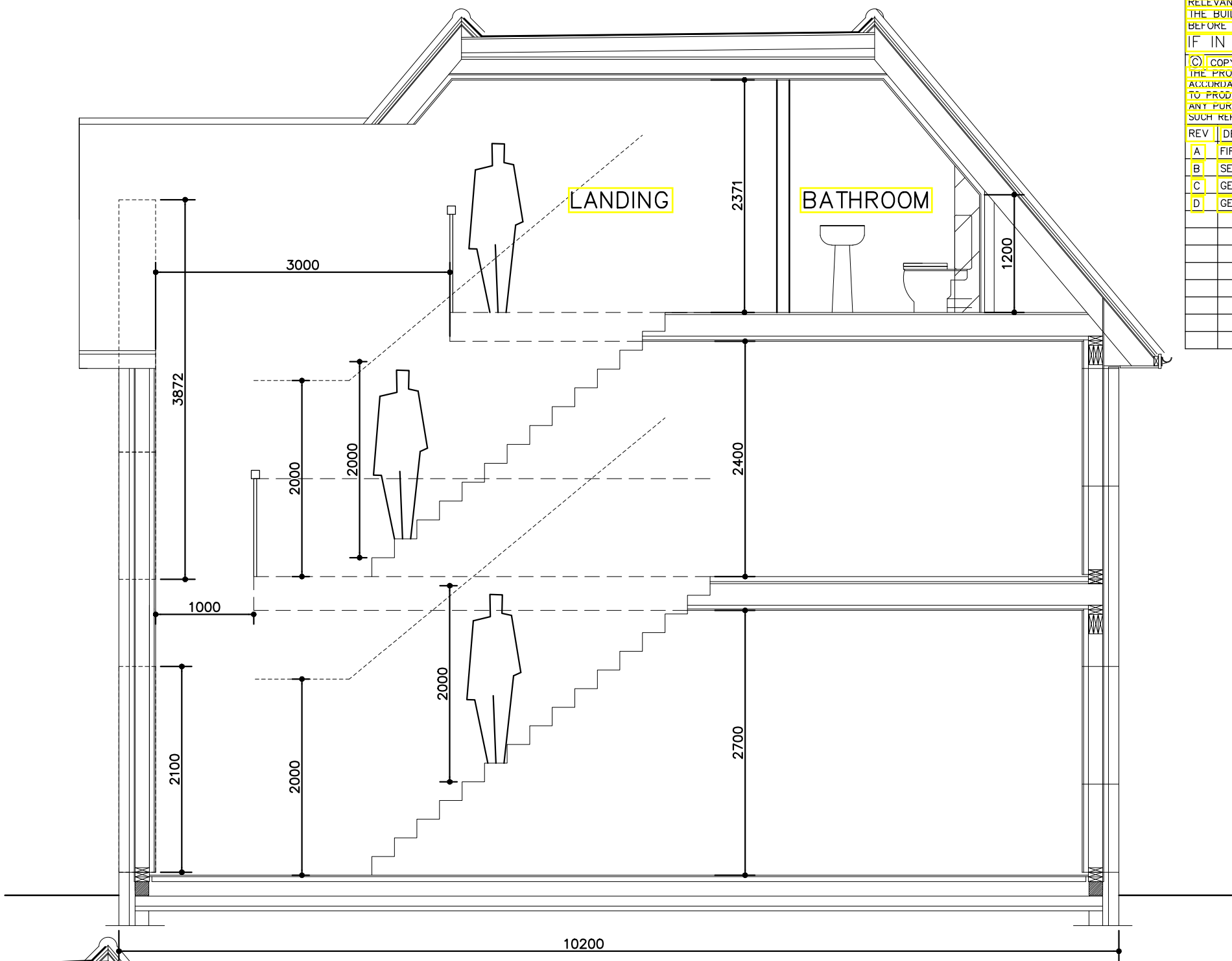
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DRAWING NUMBER
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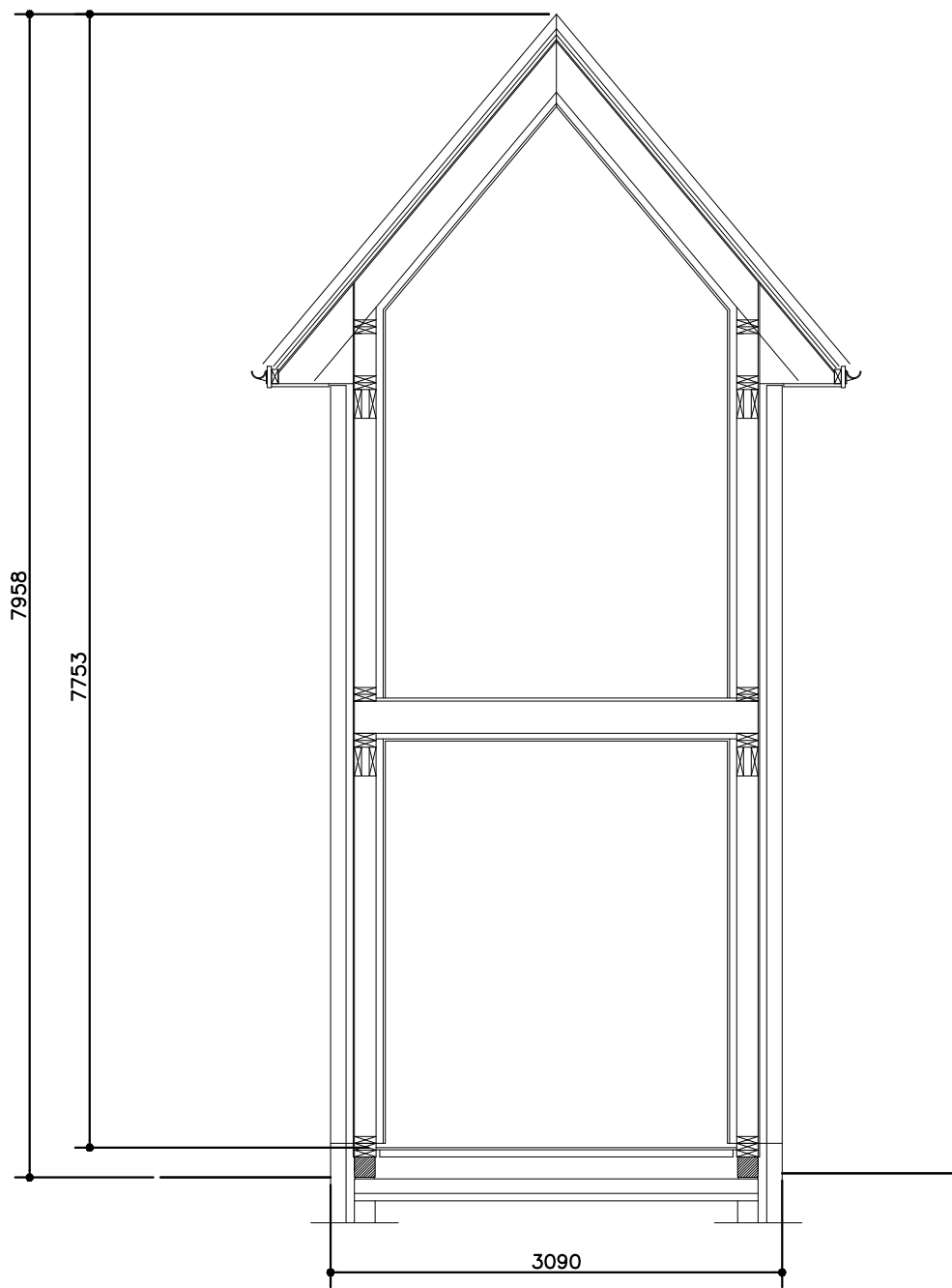
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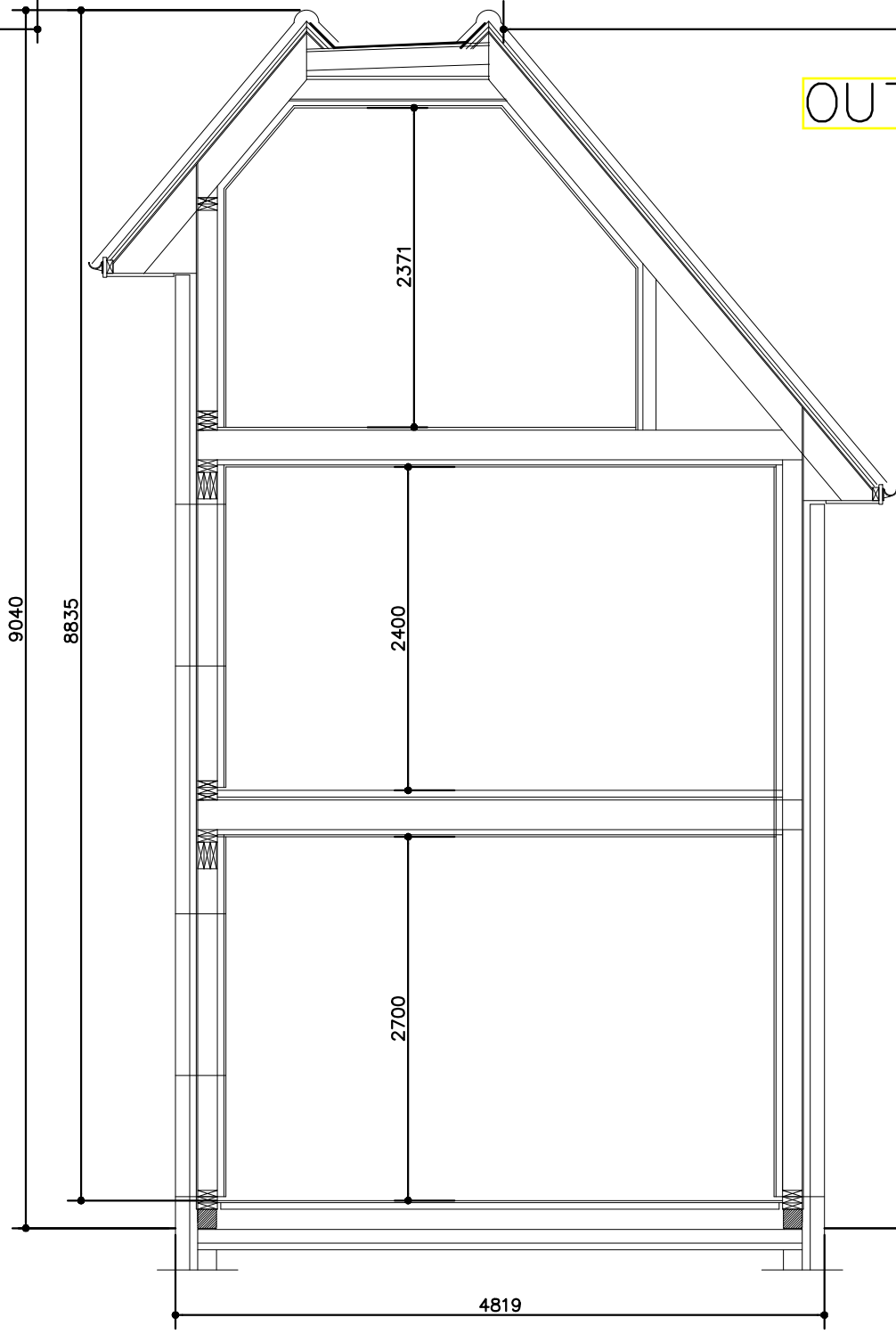
OUTLINE SECTION AA



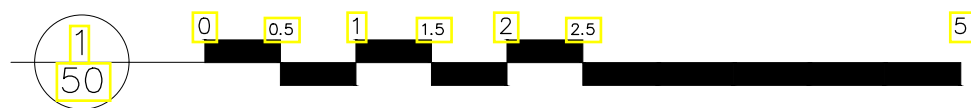
OUTLINE SECTION BB



OUTLINE SECTION CC



OUTLINE SECTION DD



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FOR: **RAHMAN**

SITE: **78 BROADWAY AVENUE
RUISLIP, MIDDLESEX
HA4 7XR**

TITLE: **PROPOSED DWELLING
OUTLINE SECTION**

C/No. 198150	O/No.	SCALE 1:50 @A2
DRAWN JP	DRAWING NUMBER 05	
DATE 1/7/25		REV D

Flood map for planning

Your reference
Unspecified

Location (easting/northing)
509402/188412

Created
21 April 2026 12:17

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see <https://www.gov.uk/guidance/flood-risk-assessment-standing-advice>)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>

Annex 3: Flood Risk Vulnerability Classification	
Essential Infrastructure:	- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. - Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood. - Wind turbines. - Solar farms.
Highly Vulnerable:	- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. - Emergency dispersal points. - Basement dwellings. - Caravans, mobile homes and park homes intended for permanent residential use. - Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)
More Vulnerable: * Landfill is as defined in Schedule 10 of the Environmental Permitting (England and Wales) Regulations 2010	- Hospitals. - Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. - Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. - Non-residential uses for health services, nurseries and educational establishments. - Landfill* and sites used for waste management facilities for hazardous waste. - Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable:	- Police, ambulance and fire stations which are not required to be operational during flooding. - Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. - Land and buildings used for agriculture and forestry. - Waste treatment (except landfill* and hazardous waste facilities). - Minerals working and processing (except for sand and gravel working). - Water treatment works which do not need to remain operational during times of flood. - Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place. - Car parks.
Water-Compatible Development:	- Flood control infrastructure. - Water transmission infrastructure and pumping stations. - Sewage transmission infrastructure and pumping stations. - Sand and gravel working. - Docks, marinas and wharves. - Navigation facilities. - Ministry of Defence installations. - Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. - Water-based recreation (excluding sleeping accommodation). - Lifeguard and coastguard stations. - Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. - Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

National Planning Policy Framework Annex 3: Flood risk vulnerability classification



Flood map for planning

Your reference

Unspecified

Location (easting/northing)

509402/188412

Scale

1:2,500

Created

21 Apr 2026 12:17

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



0 20 40 60m